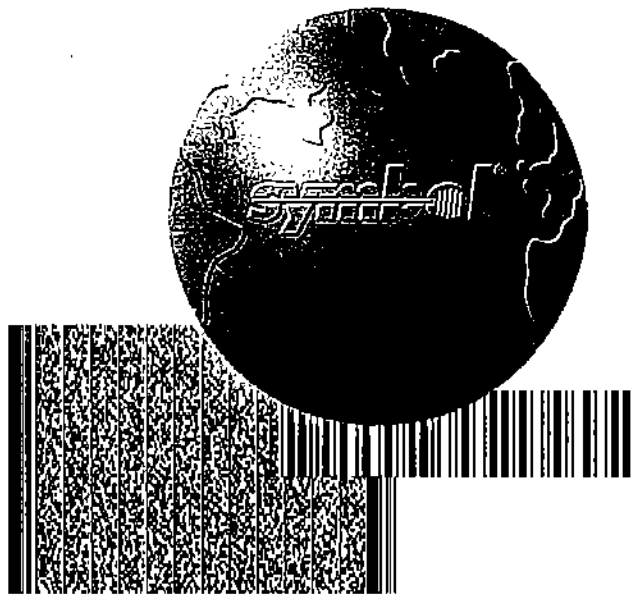


symbol

MK2000 MicroKiosk



Product Reference Guide

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***MK2000 MicroKiosk
Product Reference Guide***

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Revision A
December 2003*



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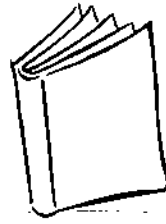
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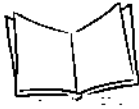
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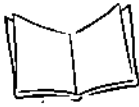
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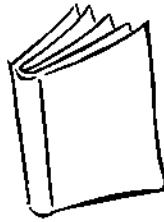
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Quick Startup Instructions



MK2000 MicroKiosk Product Reference Guide



About This Guide

Introduction

The *MK2000 MicroKiosk Product Reference Guide* provides information on installing, operating and programming the MK2000.

Note: *Unless otherwise noted, the term MK2000 refers to all configurations of the device.*

Chapter Descriptions

Following are brief descriptions of each chapter in this guide.

- Chapter 1, *MK2000 Introduction*, provides an overview of the MK2000 that includes quick start-up instructions, parts of the MK2000, features and scanning modes.
- Chapter 2, *Installation*, describes the hardware setup and installation of the MK2000.
- Chapter 3, *Setup and Configuration*, describes the MK2000 configuration steps.
- Chapter 4, *Transferring Files to the MK2000*, describes how to use Microsoft® ActiveSync for communication between the MK2000 and a host computer.
- Chapter 5, *Resident Demo Application*, describes the browser-based Resident Demo Application. Includes an operational overview of the MK2000 using the Demo application.
- Chapter 6, *System Features*, describes the wide range of capabilities used to support independent application development on the MK2000.



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- Chapter 7, *Software Development Environments*, describes the software development applications.
- Appendix A, *Technical Specifications*, provides technical information about MK2000.
- Appendix B, *Spectrum24 Network Configuration* describes how to configure the Spectrum24 wireless connection.
- Appendix C, *AirBeam Smart* describes the AirBeam Smart product, and how it is used to transfer software packages between a host computer and the MK2000.
- Appendix D, *Demo Application Bar Codes*, provides the sample bar codes that are required for use with the Demo Applications.
- Appendix E, *Terminal Configuration Manager*, provides the TCM (Terminal Configuration Manager) overview. TCM is used to specify and load files into the flash memory of the MK2000 using the terminal's Initial Program Loader (IPL).
- Appendix F, *Upgrade Procedures*, provides instructions on using the IPL mode to upgrade flash partitions.
- Appendix G, *Troubleshooting*, provides troubleshooting procedures for correcting problems encountered with the MK2000.
- Appendix H, *Setting Scanner Parameters* provides a table which lists the defaults for all scanning parameters.
- *Glossary*, provides definitions of technical terms used in this document.

Notational Conventions

This document uses these conventions:

- "User" refers to anyone using an application on the terminal.
- "You" refers to the End User, System Administrator or Technical Support person using this manual as a reference to install, configure, operate, maintain and troubleshoot the MK2000.
- *Italics* are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents. It also identifies names of windows, menus, menu items, and fields within windows.
- **BOLD** identifies buttons to be tapped or clicked.
- Bullets (•) indicate:
 - lists of alternatives or action items.
 - lists of required steps that are not necessarily sequential.
- Numbered lists indicate a set of sequential steps, i.e., those that describe step-by-step procedures.

Related Publications

The following is a list of documents that may provide additional useful information about configuring the MK2000:

- *MK2000 Quick Reference Guide*, p/n 72-57769-xx
- *MK2000 SDK (Software Development Kit)*, p/n MK2000CESDK-x.xx
- *MK2000 SMDK (Symbol Mobility Developer Kit) for .NET*
- *AirBeam Package Builder Product Reference Guide*, p/n 72-55769-xx
- *MK2000 PCK Product Reference Guide*, p/n 72-65252-xx
- *MK 2000 MSR Magnetic Stripe Reader Quick Reference Guide*, p/n 72-54435-xx

Service Information

For equipment problems, contact the Symbol Support Center. Before calling, have the model number and serial number at hand.

Call the Support Center from a phone near the equipment so that the service person can try to talk you through the problem. If the equipment is found to be working properly and the



problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If the problem cannot be solved over the phone, you may need to return the equipment for servicing. If that is necessary, you will be given specific directions.

Symbol Support Center

For service information, warranty information or technical assistance contact or call the Symbol Support Center in:

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Chapter 1

MK2000 Introduction

Overview

The MK2000 MicroKiosk allows shoppers to become more self-sufficient in the retail environment. It provides consumers access to data critical to making an informed purchasing decision, including verifying prices on bar coded merchandise and obtaining up-to-the-minute information on in-store promotions. In addition to price verification, the MK2000's large easy-to-read display can be used as an electronic billboard for instant in-store merchandising and multimedia presentations to promote seasonal sales and upcoming events. The touch screen and programmable function buttons enhance in-store applications and allow for customer interaction.

A Demo Application is available for download from: <http://devzone.symbol.com>.



MK2000 Parts

The MK2000 parts are shown in front, rear and bottom views. See Figure 1-1 on page 1-3, Figure 1-2 on page 1-4 and Figure 1-3 on page 1-5. The parts include:

- Touch screen
- Speakers and microphone
- Scanner window
- Function buttons
- Access covers
- External ports.

Touch Screen LCD

Full color 6.4 inch (16.26 cm) diagonal full VGA active matrix LCD (640 X 480 pixels) ideal for presenting text, graphics and motion video clips. The touch screen feature provides greater user interaction and enhances the capabilities of custom designed applications.

Speakers and Microphone

The MK2000's speakers are ideal for multimedia applications.

The MK2000 also has a built-in front-mounted microphone which can be used for voice recording.

Scanner Window

The scanner window protects the scan engine.

Function Buttons

The MK2000 has four programmable function buttons (shown in Figure 1-1 on page 1-3). The buttons are functionally identified **A**, **B**, **C** and **D** (from right to left) for reference purposes in this document only. The alphabetic button labeling is not physically present on the MK2000. These buttons are programmable to allow the user to perform various tasks such as navigating through an application and making decisions when prompted. For a detailed description of setting the buttons' values, refer to *Remapping Buttons* on page 6-6.

Access Covers

The rear of the MK2000 has three access covers that allow access to the expansion card slot features of the MK2000. Expansion card slot access is intended only for development or maintenance purposes and requires removal of the access cover.

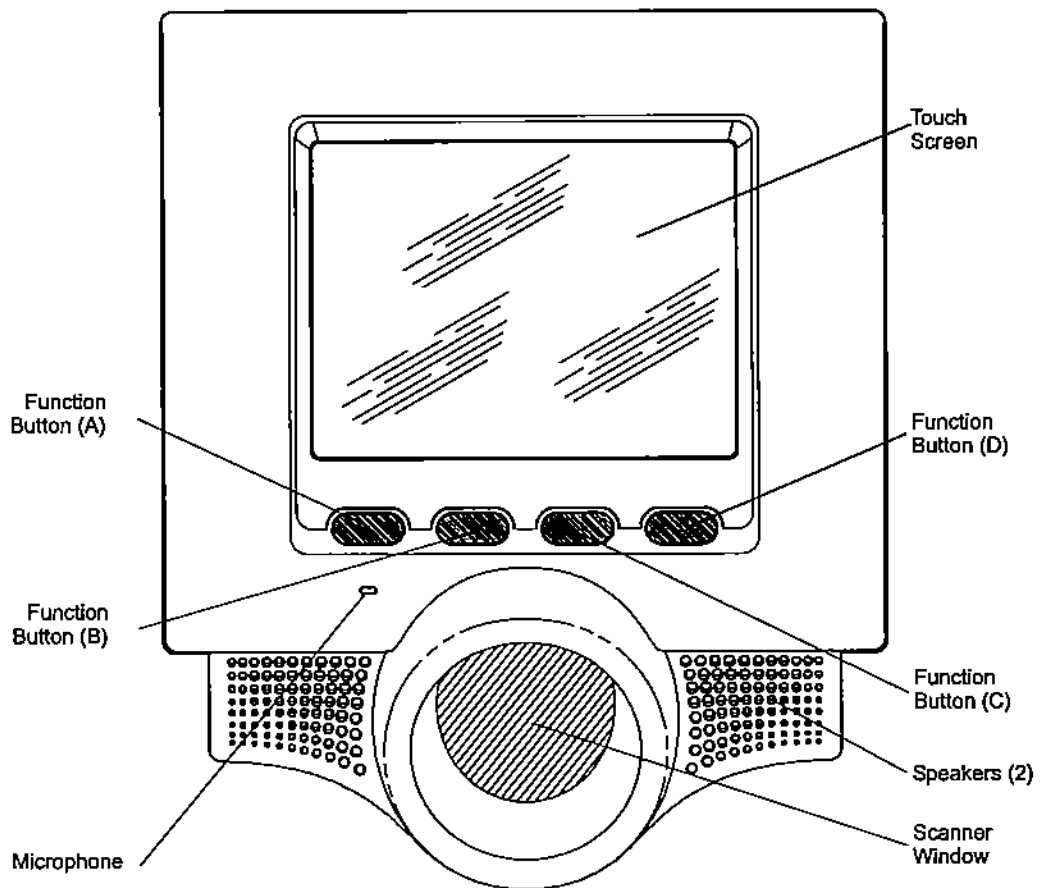


Figure 1-1. MK2000 Front View

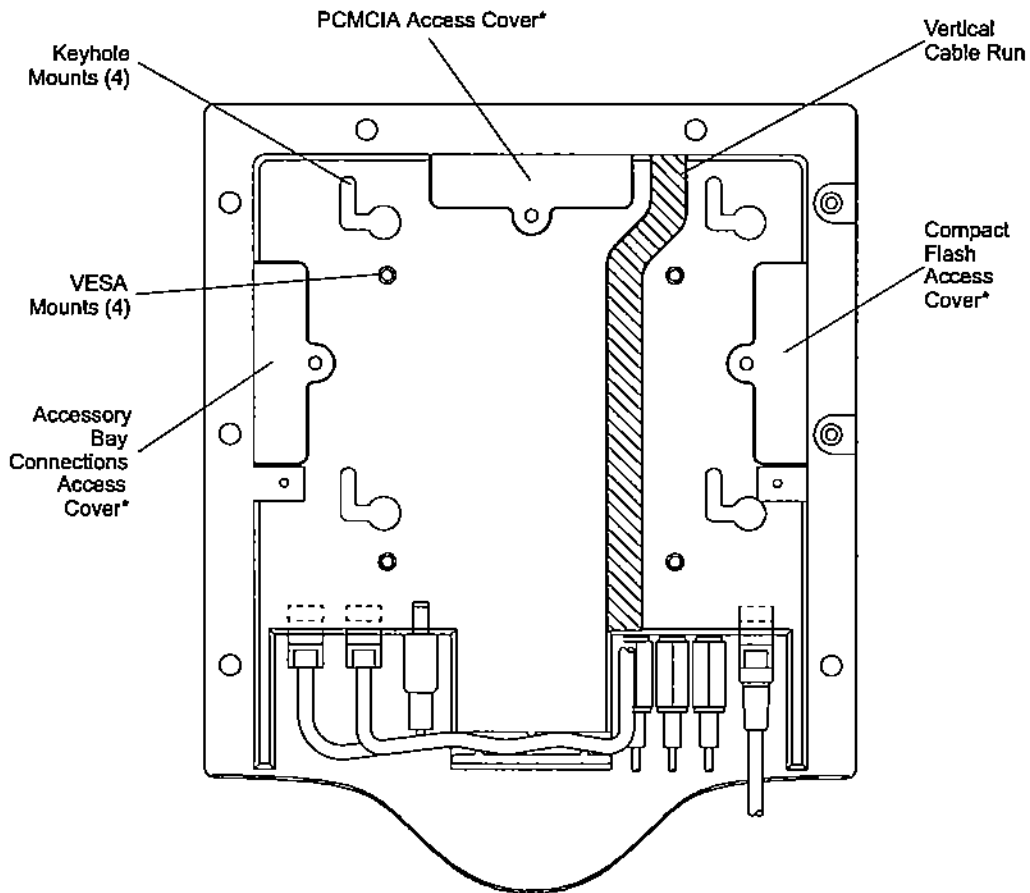
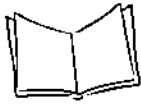


Figure 1-2. MK2000 Rear View

Caution

*While any of the access covers are removed, the user must follow proper ESD (Electro-Static Discharge) precautions to avoid damaging sensitive components. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions may cause damage to the MK2000 and could potentially void your warranty.

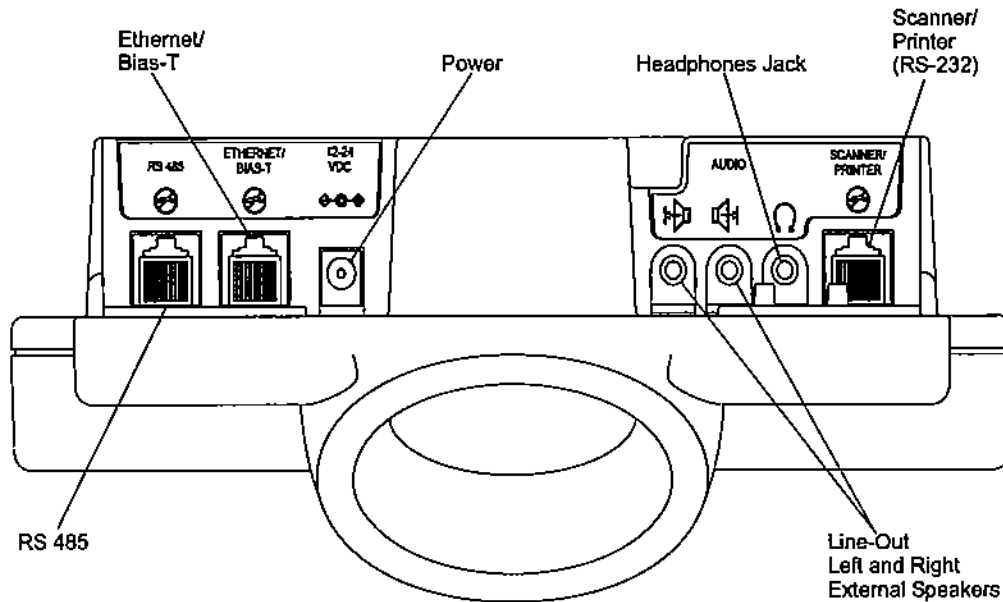


Figure 1-3. MK2000 Bottom (Connectors) View

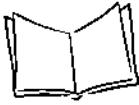
External Ports

The MK2000 has the following external ports located at the rear/bottom (see Figure 1-3):

- RS485
- Ethernet / Bias-T (Power-over-Ethernet)
- Power
- Line out - Left and Right External Speakers
- Headphones
- Scanner/Printer (RS-232, powered).

RS-485

RS-485 (10-conductor RJ-45 plug) is sometimes termed the Multidrop LAN since it can connect several MK2000s in a LAN network environment. See Figure 2-10 on page 2-17. These devices are all connected to a single pair wire (i.e., transmit and receive share the same two wires).



Ethernet/Bias-T

Wired Ethernet: Power via AC Outlet

The Ethernet / Bias-T port can be used for an Ethernet data connection. It uses a 10-conductor RJ-45 plug. With this Ethernet installation the MK2000 receives power via the Symbol approved power supply.

Wired Ethernet: Power via Power-over-Ethernet

The MK2000 supports Power-over-Ethernet (POE) Symbol Technologies' Bias-T functionality. When an Ethernet (10/100Base-T) cable is connected to the Ethernet/Bias-T port, in addition to being the conduit for data exchange, it can also be used as a conduit to provide power to the MK2000.

Power Port

The MK2000 can be powered by a Symbol power supply plugged into the power port (2.0 mm barrel jack connector) on the rear of the MK2000. For additional information, refer to *Power* on page 2-10 and/or *Technical Specifications* on page A-1.

Line out - Left and Right External Speakers

Provides connections (3.5 mm) for left and right external speakers. Each line is powered, 2.2 watts per channel. Internal speakers are muted when the external speakers are connected.

Headphones Jack

Provides a standard 3.5 mm headphone connection. This standard jack is compatible with headphones used on many portable audio products (MP3 players). Headphones that do not protrude into the ear are recommended. The internal and external speakers are disabled when the headphones jack is used.

Scanner/Printer (RS-232)

The Scanner/Printer (RS-232) port (RJ-45 jack, 10 conductor) is powered (5V/500mA) and can be used for serial communication with a host, connection of an external device such as a decoded scanner or portable printer. It is important to confirm the cable pin-outs before attaching the cable. For cable pin-outs, refer to *Scanner/Printer (RS-232) Port Connections* on page 2-23.

MK2000 Features

Programmable Function Buttons

The MK2000 has four function buttons that are programmable. These buttons can be programmed to allow users to perform various tasks such as navigation through an application or selecting between various options. See *Figure 1-1 on page 1-3*.

Bar Code Scanner

Provides superior scanning capabilities. Omni-directional scan pattern decodes all traditional 1D bar codes. In addition, 2D symbologies such as PDF and composite codes can be scanned in Smart Raster mode, refer to *Bar Code Scanning on page 1-9*.

Software

Open architecture development tools are used to ease application development including Microsoft® Windows® CE .NET operating system, Internet Explorer 5.5 and Windows CE Media Player.

Touch Screen

The touch screen provides user interaction and enhances the capabilities of custom designed applications.

Magnetic Stripe Reader (Optional)

An optional three-track Magnetic Stripe Reader (MSR) module can be attached to the MK2000. The Magnetic Stripe Reader provides the capability to read and process loyalty card and credit card transactions.

Memory

The MK2000 standard system configuration contains 64 MB flash/32 MB DRAM. The Flash Memory is non-volatile and is responsible for storing the system firmware.

The Dynamic Random Access Memory (DRAM) is used for storage of system parameters, user programs and data and for use by the system as a whole during normal program executions. Items such as bitmaps can also be stored and retrieved for later use.

Connectivity Options

The MK2000 connectivity options include wired 10/100 Mbps Ethernet, Printer/Scanner (RS-232) and RS-485 as well as wireless 802.11 2Mbps and 802.11b 11Mbps.



Two Expansion Card Slots

The MK2000 contains two expansion slots: one Personal Computer Memory Card International Association (PCMCIA) slot and one Compact Memory Flash (CF) slot. The PCMCIA card slot also has a connection to an internal antenna (for an RF card). Common uses for the expansion card slots include enabling the insertion of:

- Spectrum 24 wireless radio card (PCMCIA slot only)
- Flash memory card.

Note: When a Compact Flash card is added to the MK2000, it effectively adds more Flash memory.

Power Options

As an alternative to the standard Symbol approved power supply, power can be supplied by Power Over Ethernet (POE). The POE option may be utilized even if an Ethernet cable is not used for data transmission.

Mounting Options

The MK2000 can be mounted using the standard Symbol provided mounting options; wall mounting and pole mounting, refer to *MK2000 Mounting* on page 2-3. The MK2000 can also be mounted using any commercially available bracket or stand that conforms to the 100 mm Video Electronics Standards Association (VESA) Flat Panel Monitor Physical Mounting Interface (FPMPMI™) mounting standards.

Signage (Optional)

A user designed foam core sign can be attached to the MK2000 using the optional *Signage Mounting Kit*. The *Signage Mounting Kit* placard mounting brackets will accommodate foam core or other material signs in the range from 1/8" to 3/8" in thickness, refer to *Signage* on page 2-18.

Software Development Kit (SDK)

Two software developer kits exist for the MK2000. The conventional SDK (refer to *Conventional SDK* on page 7-2) covers unmanaged (C and C++) and thin client (browser and RDP) applications, and the SMDK for .NET (refer to *Symbol Mobility Developer Kit (SMDK) for .NET* on page 7-2) covers managed (C# and VB.NET) applications.




Bar Code Scanning

The MK2000 automatically decodes a bar code presented in its field of view. It decodes all traditional retail bar codes plus PDF, RSS and composite bar codes.

Scanning Modes

The MK2000 operates in a number of selectable scanning modes, Table 1-1 lists the MK2000 scan modes:

Table 1-1. Common Scan Modes

Scan Mode	Description	Scan Pattern
Cyclone Omnidirectional 1D Scan Pattern (factory default)	This is a highly efficient omnidirectional scan pattern which decodes 1D and EAN/UCC reduced space symbologies in any orientation Note: While in this mode, the MK2000 does not decode 2D bar codes like PDF417.	
Always Raster Scan Pattern	Directly opens the laser to a full sized Raster pattern. Decodes 1D, PDF417, RSS and Composite Codes.	
Smart Raster Scan Pattern	Creates a single scan line which opens vertically for PDF417 symbols using the Smart Raster feature. This feature autodetects the type of bar code being scanned and adjusts its pattern accordingly. This provides optimal performance on 1D, PDF417, EAN/UCC, RSS and Composite Codes.	



Scanning Guidelines

When scanning a bar code:

- Hold the bar code at an angle which does not cause specular reflection (refer to *Specular Reflection* on page 1-14).
- Hold the bar coded item close for small bar codes and farther away for large bar codes.

Cyclone Omnidirectional

In Cyclone Omnidirectional mode the scan pattern is set to decode standard and EAN/UCC reduced space symbologies in any orientation. This mode cannot be used to decode 2D bar codes like PDF417.

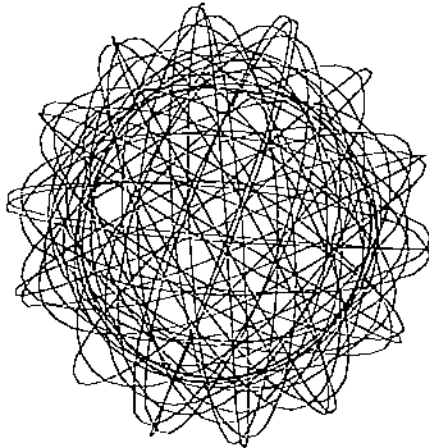


Figure 1-4. Cyclone Omnidirectional Pattern

Smart Raster

In Smart Raster mode, a single scan line pattern appears. If the bar code is a standard bar code, the scanner decodes the symbol. If the bar code is a 2D bar code, the scanning patterns open up to a full, optimized Raster pattern as soon as the scanner is properly aligned over the bar code.

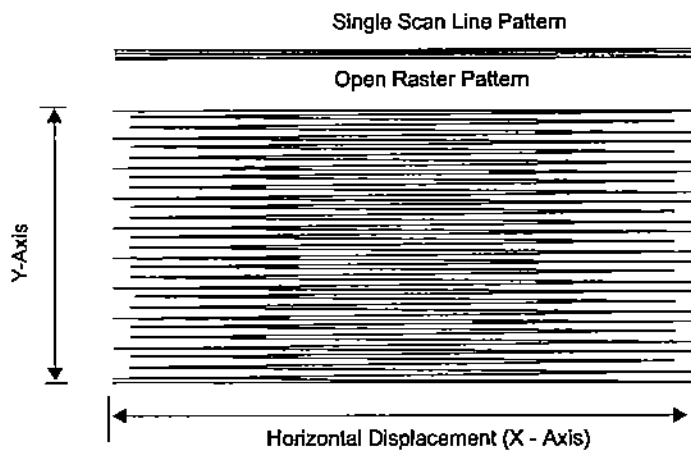
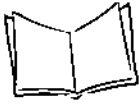


Figure 1-5. Smart Raster Scanning Pattern

When using the Raster pattern, the pattern must cover the top and bottom of the 2D symbol. If it does not completely cover the bar code pull the bar code further away until the pattern completely covers the bar code. Make sure the scan pattern extends *at least three quarters of an inch* beyond the edges of the bar code.



Figure 1-6. Raster Pattern Expanded Over PDF417 Bar Code



If the vertical scan pattern is not high enough to cover a "tall" PDF417 symbol, move the bar code slowly down toward the bottom of the scan beam, keeping the beam horizontal to the rows and then slowly back upward to the top. Alternatively, move the bar code further away from the scanner until the scan pattern covers a larger portion of the bar code in the vertical direction.

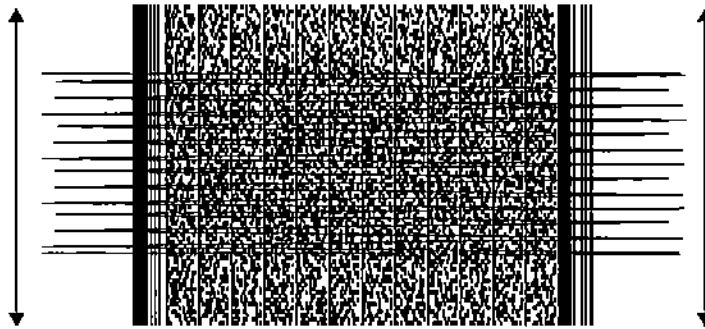


Figure 1-7. Moving Scan Pattern Upward and Downward on "Tall" PDF417 Bar Code

The scan beam does not have to be *perfectly* parallel with the top and bottom of the symbol (up to a 4° tilt is permitted).

Ensure the symbol is in good condition.

Scanning Composite (2D) Bar Codes

A composite bar code is a combination of a standard bar code (RSS, UPC/EAN or UPC/EAN-128) and a 2D bar code (CC-A, CC-B or CC-C).

When scanning a composite bar code:

- Keep the scan pattern parallel to the 2D symbol's rows.
- Hold the bar coded item at an angle which does not cause specular reflection (refer to *Specular Reflection* on page 1-14).
- Hold the bar code close for small bar codes and farther away for large bar codes.
- When using the single scan line pattern, aim the scan line at the middle of the 2D portion. The scan pattern will open up to an optimized Raster pattern and decode both the 2D and standard bar code portion of the composite code.



Aim the single scan line at the center of the 2D portion



Raster pattern will expand to decode both portions

Figure 1-8. Composite Scanning



Specular Reflection

When laser beams reflect *directly* back into the scanner from the bar code, they can “blind” the scanner and make decoding difficult. This phenomenon is called specular reflection.

To avoid this, scan the bar code so that the beam does not bounce *directly* back. But don't scan at too oblique an angle; the scanner needs to collect scattered reflections from the scan to make a successful decode. Practice quickly shows what tolerances to work within.

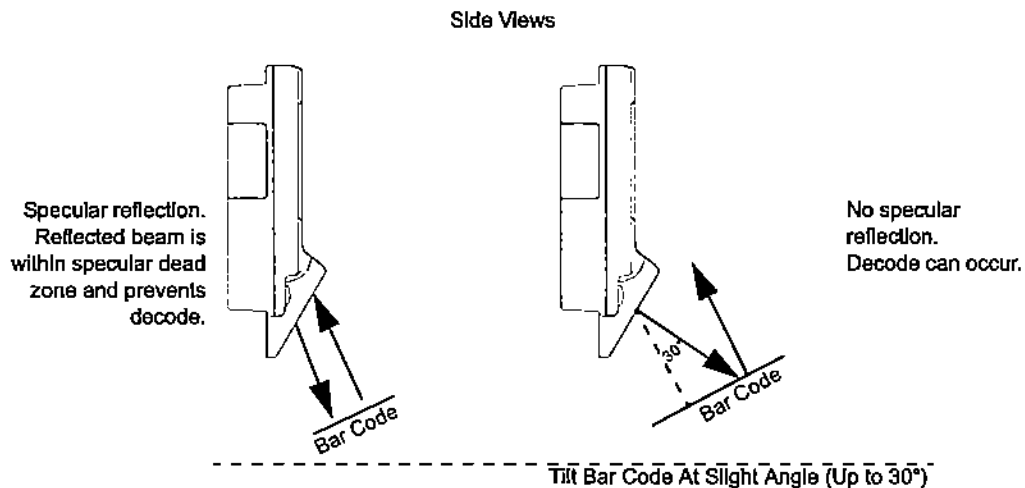


Figure 1-9. Avoiding Specular Reflection

When scanning a 1D bar code, there is only a small specular dead zone to avoid ($\pm 2^\circ$ from the direct laser beam). The specular dead zone is larger for scanning PDF417 ($\pm 9^\circ$ from the direct laser beam). However, the scanner is not effective if its beams hit the bar code's surface at an angle greater than 30° from the normal to that surface.



Chapter 2 *Installation*

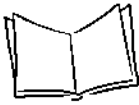
Overview

This chapter describes the MK2000 installation. Topics covered include:

- **Unpacking**
- **Installation steps**
 - **Mounting**
 - **Providing power**
 - **Communications interfaces**
 - **Installing accessories**
 - **Peripherals**
 - **Signage**
- **Connector pin-outs**
- **Optional accessories.**

Unpacking the MK2000

Remove the MK2000 from its packing and inspect it for damage. Keep the packing, it is the approved shipping container and should be used if the MK2000 ever needs to be returned for servicing.



Installation Overview

To install the MK2000 perform the following six steps:

1. Select the mounting method:
 - Wall Mount
 - Pole Mount
 - Desk Mount.Refer to *MK2000 Mounting* on page 2-3 for mounting instructions.
2. Select the method of supplying power:
 - Symbol AC power supply
 - Power-over-Ethernet.Refer to *Power* on page 2-10 for power connection options.
3. Select the data communications method:
 - Wired Ethernet (10/100 Base-T cable)
 - Wireless Ethernet (2Mb or 11Mb RF)
 - Wired RS-485 (serial cable)
 - Wired Scanner/Printer (RS-232, serial cable).Refer to *Communication Interfaces* on page 2-11.
4. Select optional peripherals:
 - Printer
 - External hand held scannerRefer to *Peripherals* on page 2-18.
5. For Configuration settings:
 - To configure the MK2000 refer to: *Configuration Utility* on page 3-3, *System Menu* on page 3-40, or the Windows[®] CE desktop (*Control Panel Configuration Parameters* on page 3-41).
 - Access the Windows[®] CE Desktop. Refer to *Accessing the Windows[®] CE Desktop* on page 6-5.
6. Add a sign to the MK2000 (if desired). Refer to *Signage* on page 2-18.

MK2000 Mounting

The MK2000 can be mounted on a wall, pole or counter top. See Figure 2-1 on page 2-3 for mounting dimensions. Separately sold mounting accessories are listed below:

- Wall Mounts
- Pole Mount Kit, see page 2-7
- VESA Mounting, see page 2-8.

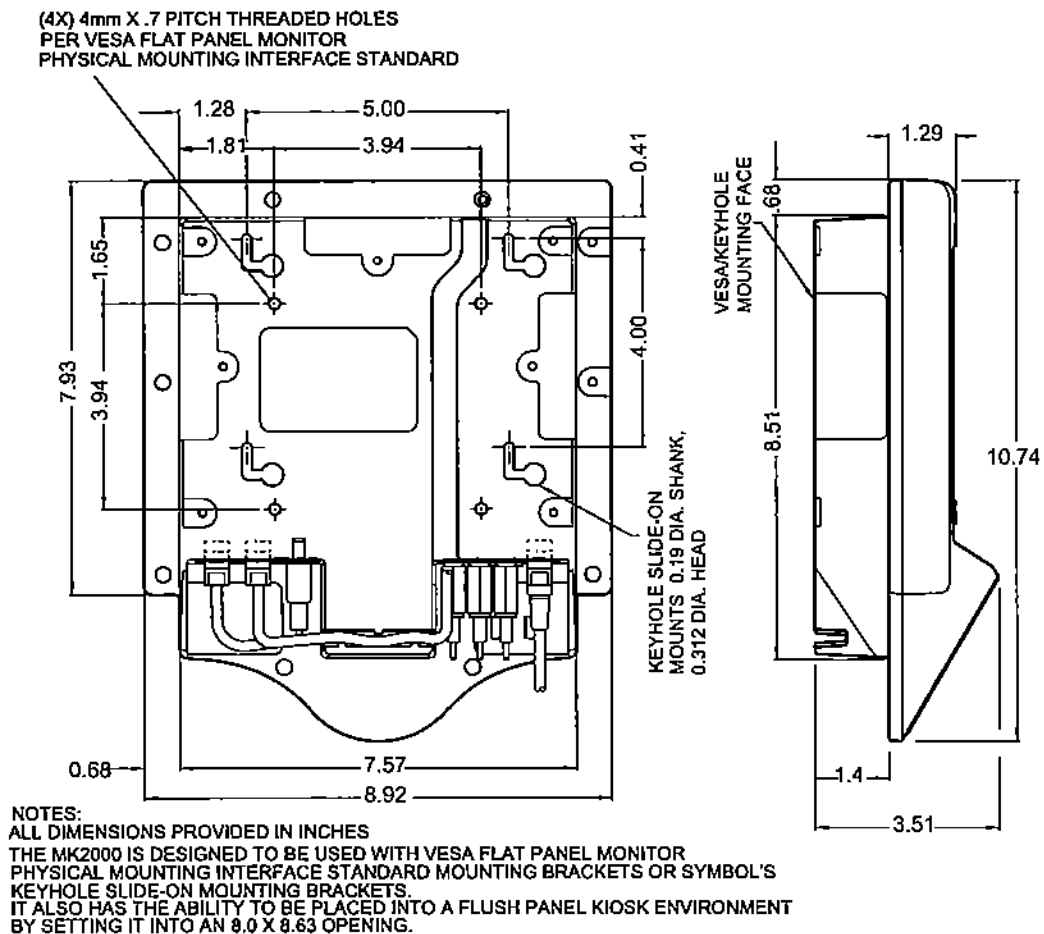


Figure 2-1. Mounting Dimensions



MK2000 Wall Mounting Options

The MK2000 mounting options include:

- Wall Mount Kit (see page 2-4)
- Recessing the MK2000 into a kiosk or wall (see page 2-6).

Using the Wall Mount Kit

1. Determine the MK2000 mounting location.
2. Follow the instructions and use the template provided with the MK2000. Four #10 wood screws are provided for securing the Connector/Port Cover to the wall. The installer may need to source alternate fasteners appropriate for the wall material.
3. Connect the cables to the MK2000 (see Figure 1-3 on page 1-5) and ensure the cables have been routed and secured correctly (see Figure 2-4 on page 2-6). Cables that are incorrectly mounted or secured may become pinched when the terminal is attached to the Connector/Port Cover. Install the Connector/Port Cover, place the keyholes on the back housing over the shoulder head bolts protruding from the plate and slide the MK2000 to the left and down to secure in place. Refer to *Wall Mounting Kit* on page 2-5 and *Mounting Directions* on page 2-5.
4. After the MK2000 is installed, screw one 8-32 pan head screw (lock screw) into the Connector/Port Cover tab (located at the top left corner). Hand tighten the screw or for additional security use a nylon locknut (not included). This screw prevents removal of the terminal.
5. When the mounting is completed, return to *Installation Overview* on page 2-2 and proceed with step 2, *Select the method of supplying power*.
6. When the power installation is completed, return to *Installation Overview* on page 2-2 and proceed with step 3, *Select the data communications method*.

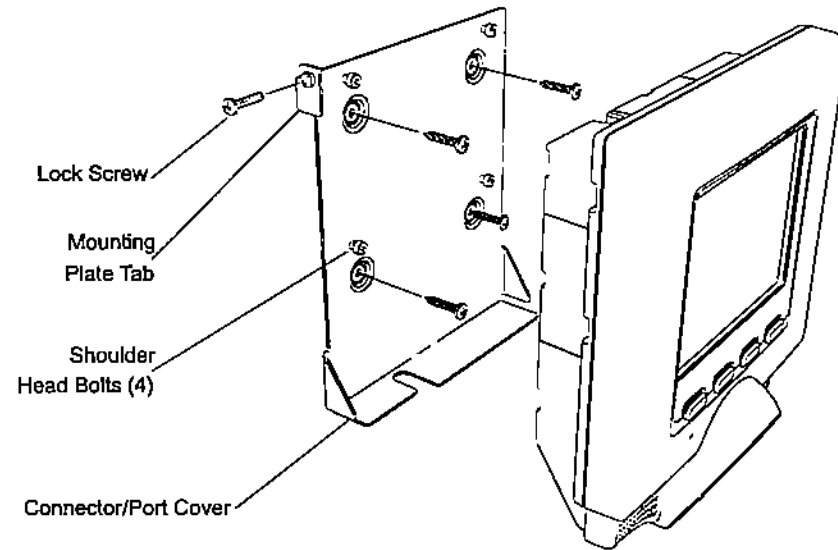


Figure 2-2. Wall Mounting Kit

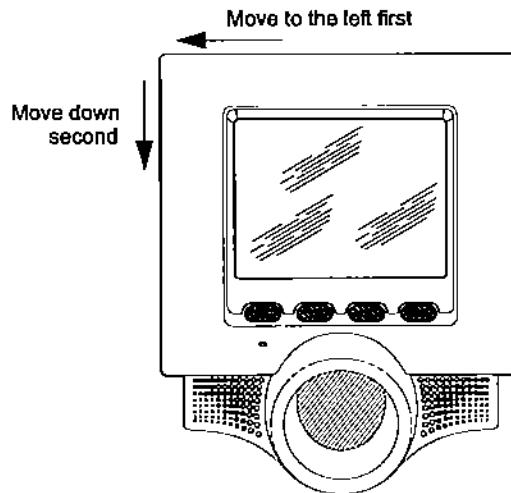


Figure 2-3. Mounting Directions

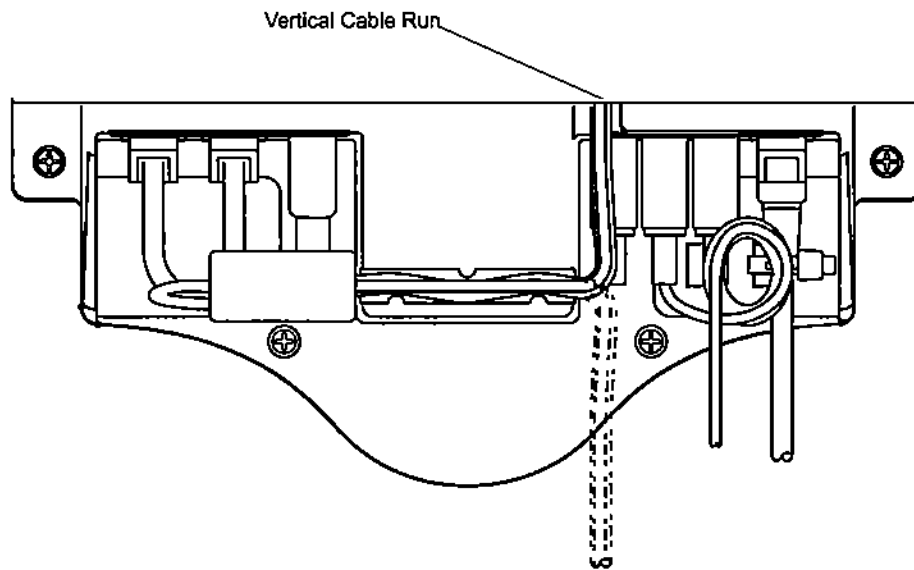
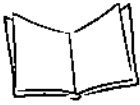


Figure 2-4. Cable Routing

Recessed Wall/Kiosk Mounting

To recess the MK2000, use the same basic steps outlined in *Using the Wall Mount Kit* on page 2-4. The exception is that an opening needs to be cut. The opening should be 8.63" minimum height x 8.0" minimum width, in a wall or kiosk. The back housing is placed into the opening. Refer to *Wall Mounting Kit* on page 2-5 and *Mounting Directions* on page 2-5. Symbol does not provide hardware to support this installation. Recessed mounting may degrade the wireless network performance.

Pole Mounting

A Pole Mounting Kit is available for mounting the MK2000. The Pole Mounting Kit can accommodate poles up to 11.5 inches in diameter.

1. To install the MK2000 using the Pole Mounting Kit, wrap the pole mount straps around the pole and tighten.
2. Secure the connector port cover to the pole mount bracket using the four shoulder screws.
3. Connect the cables to the MK2000 (see Figure 1-3 on page 1-5) and ensure the cables have been routed and secured correctly (see Figure 2-4 on page 2-6). Cables that are incorrectly mounted or secured may become pinched when the terminal is attached to the Connector/Port Cover.
4. Position the MK2000 keyholes located on the back housing, (see Figure 1-2 on page 1-4) over the shoulder head bolts and slide the MK2000 to the left and down to secure in place. Refer to *Wall Mounting Kit* on page 2-5 and *Mounting Directions* on page 2-5.
5. After the MK2000 is installed, screw one 8-32 pan head locking screw into the pole mount bracket bottom left tab. See Figure 2-5 on page 2-8. Hand tighten the locking screw or for additional security use a nylon locknut (not included). The locking screw prevents removal of the terminal.
6. When the power installation is completed, return to *Installation Overview* on page 2-2 and proceed with step 3, *Select the data communications method*.

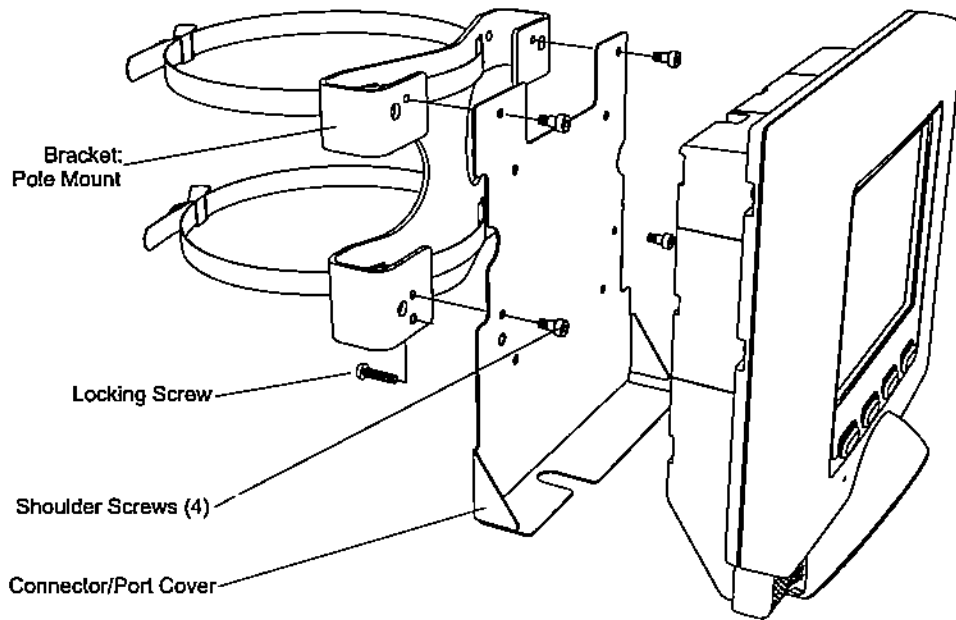
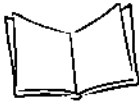


Figure 2-5. Pole Mount Kit

VESA Mounting

The MK2000 includes provisions for mounting using industry standard VESA mounting solutions. See Figure 2-6 on page 2-9 and Figure 2-1 on page 2-3. The MK2000's rear housing includes four VESA® standard (M4 threads at a 100mm x 100mm spacing) screw holes. The VESA® (Video Electronics Standards Association) industry standard mounting interface allows many Off-the-Shelf 3rd party stands to be used with the MK2000. To find commercially available Off-the-Shelf stands, search the internet for "VESA Mount".

Symbol also offers an optional VESA Mounting Kit. The kit includes a Connector/Port Cover which provides enhanced security by covering the MK2000's cables and ports (see Figure 2-6 on page 2-9).

1. Route and secure the cables, confirming that the cables are not pinched. See Figure 2-4 on page 2-6. Position the Connector/Port Cover between the 3rd party VESA mount and the MK2000. The MK2000 is secured to the VESA mount with four M4 screws. The Connector/Port Cover protects the cables and connections at the back of the MK2000 and prevents tampering.

2. When the power installation is completed, return to *Installation Overview* on page 2-2 and proceed with step 3, *Select the data communications method*.

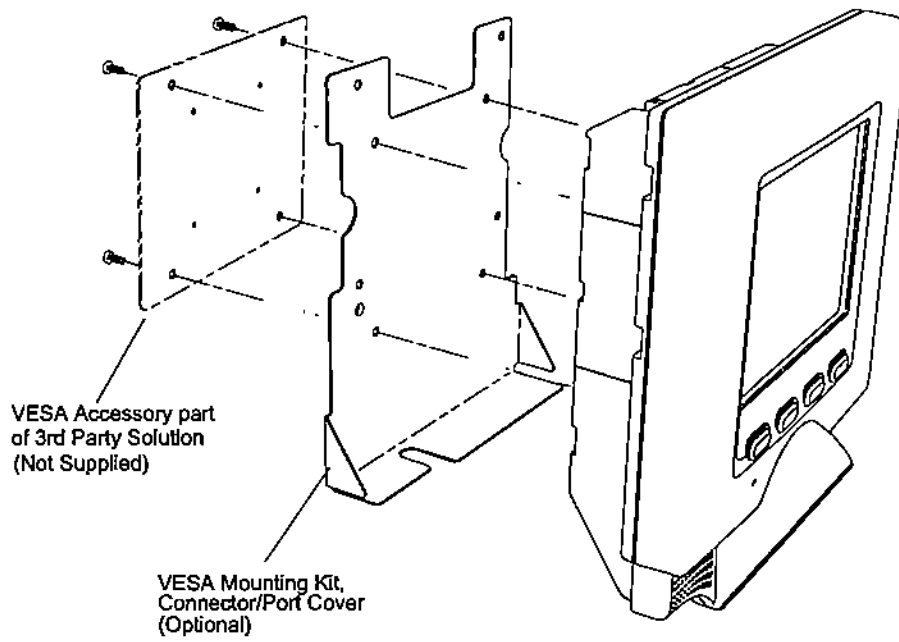
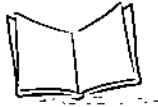


Figure 2-6. VESA Mounting



Power

The MK2000 power can be supplied by using the Symbol universal AC power supply or by using Symbol's BiasT, the *Power-over-Ethernet* option.

AC Power Supply Connection

The MK2000 can be powered by the Symbol universal AC power supply plugged into the power port on the rear of the MK2000 via a 2.0mm barrel jack. The power supply has a positive center pin and the outer tab is ground. It is compatible with:

- 120V 60Hz (North America)
- 230V 50Hz (International excluding Japan)
- 100V 50/60Hz (Japan).

To connect the Symbol universal AC power supply:

1. Insert the power supply's barrel connector into the MK2000's power port. See Figure 1-3 on page 1-5.
2. Route the power cable. See Figure 1-3 on page 1-5.
3. Plug the Symbol AC power supply into a wall outlet.
4. When the power installation is completed, return to *Installation Overview* on page 2-2 and proceed with step 3, *Select the data communications method*.

Power-Over-Ethernet Connection

The Ethernet cable in the *Power-over-Ethernet* (POE) installation has two components, power and data. The Ethernet cable can be used to supply only power, only data or both power and data.

Power Connection (Attach the Ethernet cable):

1. Connect the Ethernet cable to the Ethernet port on the MK2000. See Figure 1-3 on page 1-5 for port locations. Ensure the Ethernet cable is terminated according to the *Ethernet / Bias-T Port Connections* described in *Table 2-2*.
2. Plug the other end of the Ethernet cable into the POE Bias-T module.
3. If Ethernet cable will be supplying both power and data, proceed to *Installation Overview* on page 2-2 and proceed with step 2, *Select the method of supplying power*. If Ethernet cable will only be supplying power proceed directly to *Installation Overview* on page 2-2 and proceed with step 3, *Select the data communications method*.

4. Connect the DC Power Supply to the Bias-T module.

Data Connection:

Connect a patch cable from the Bias-T (Power-over-Ethernet) module to the host system's Ethernet port.

Communication Interfaces

The MK2000 communications interfaces include both wired and wireless solutions:

- **Wired Ethernet (10/100Base-T cable)**
 - Power via AC outlet (see page 2-11)
 - Power via Power-over-Ethernet (see page 2-12)
- **Wireless Ethernet (2Mb or 11Mb RF)**
 - Power via AC outlet (see page 2-11)
 - Power via Power-over-Ethernet (see page 2-12)
- **Wired RS-485 (serial cable).** See page 2-15.
- **Wired RS-232 (serial cable).** See page 2-16.

To configure the communications interfaces, refer to the *Configuration Utility* on page 3-3. To access the Windows® CE Desktop, refer to *Accessing the Windows® CE Desktop* on page 6-5.

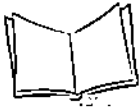
Wired Ethernet

The MK2000 communication options include a wired Ethernet connection (10/100Base-T cable). When a wired Ethernet connection is used the MK2000 can be powered either using the MK2000's Symbol AC power supply connected to an AC outlet, or by receiving Power-over-Ethernet through the Ethernet cable.

Wired Ethernet: Power via AC Outlet

With this option, the MK2000 communicates to the host via a 10/100Base-T Ethernet cable and receives power via a Symbol AC power supply plugged into an AC outlet. Refer to *AC Power Supply Connection* on page 2-10.

1. Connect the Ethernet cable to the LAN port on the MK2000. See Figure 1-3 on page 1-5.
2. Ensure the Ethernet cable is terminated according to Table 2-2 on page 2-22.
3. Plug the other end of the Ethernet cable into the host system's LAN port.



Wired Ethernet: Power via POE

The POE installation option allows the MK2000 to communicate and receive power on the same 10/100Base-T Ethernet cable. See Figure 2-7 on page 2-13 and Figure 2-8 on page 2-14.

Caution

POE should NOT be used in conjunction with an external power supply connected to the power port on the MK2000. Using two power sources may damage the MK2000 and/or the network.

1. Connect the Ethernet cable to the MK2000 Ethernet / Bias-T port. See Figure 1-3 on page 1-5.
2. Ensure the Ethernet cable is terminated according to Table 2-2 on page 2-22.
3. Plug the other end of the Ethernet cable into the Bias-T (POE) module.
4. Connect a patch cable from the Bias-T (POE) module to the host system's LAN port.
5. Connect the DC Power Supply to the Bias-T module.

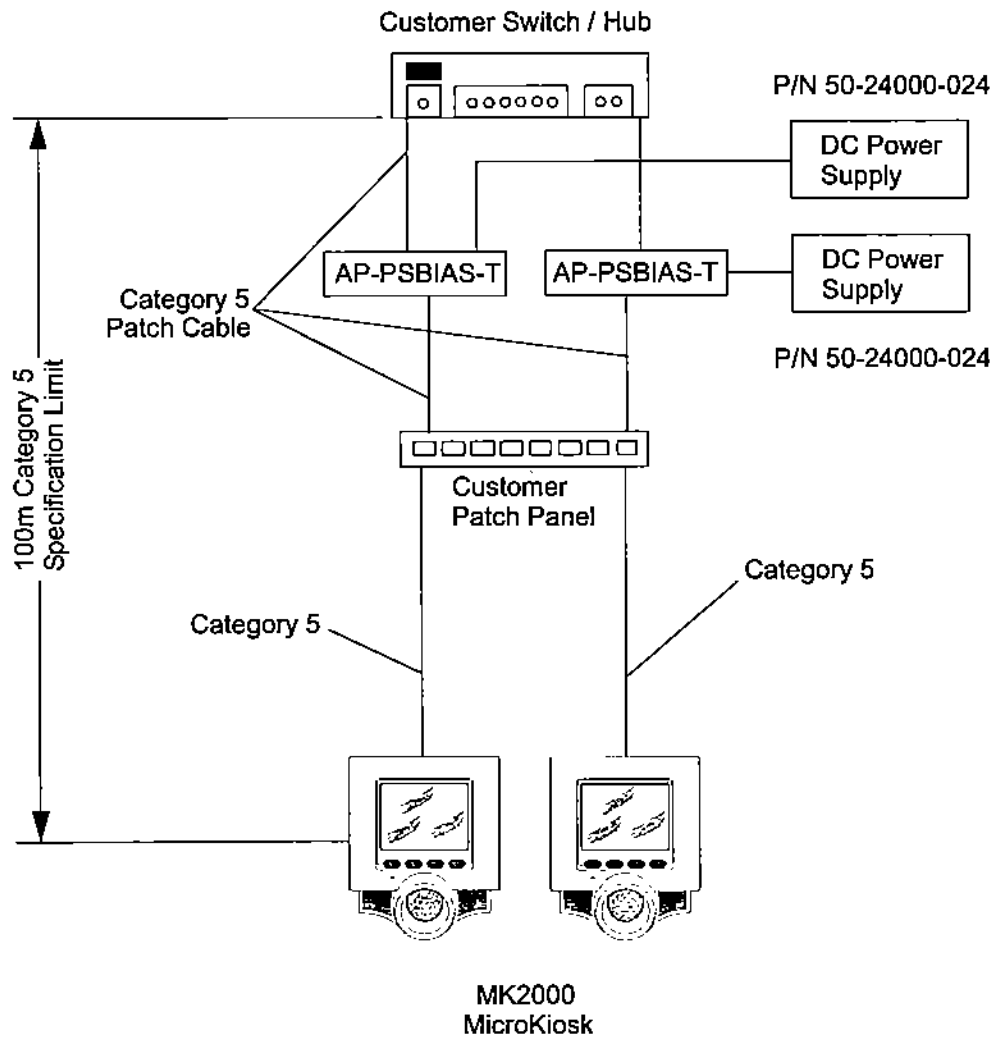


Figure 2-7. MK2000 Power-Over-Ethernet, Network Connectivity

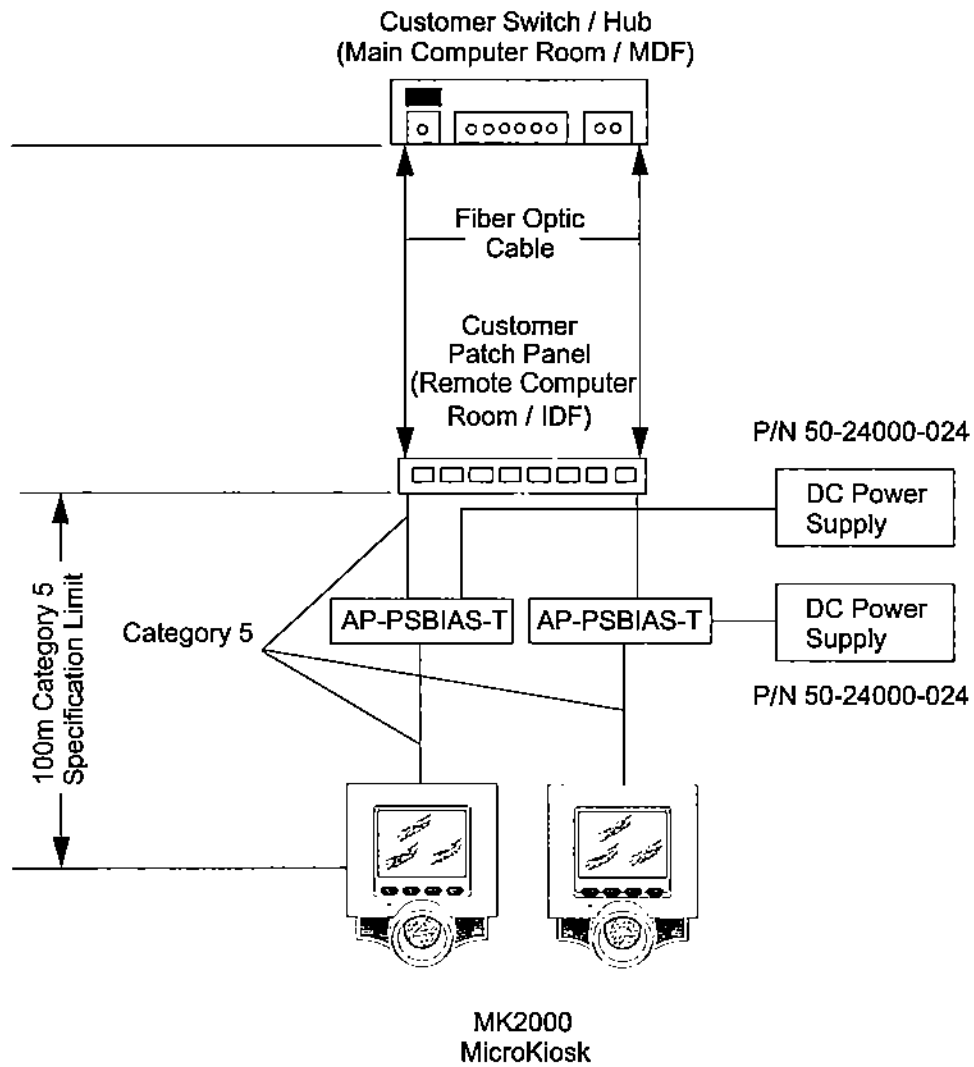


Figure 2-8. Alternate MK2000 Power-Over-Ethernet, Network Connectivity

Wired RS-485 Setup

The MK2000 can communicate with a host via a wired RS-485 serial connection. Typically the MK2000 Symbol AC power supply is used with this communications interface.

For MK2000s installed where pre-existing PCK 9100, PCK 9140 or MK1000 wiring exists, the pre-existing wiring can be plugged directly into the MK2000.

RS-485 is a two-wire multidrop network: RS-485 signal and RS-485 inverted signal. See Figure 2-10 on page 2-17 for an illustration of a two-wire network.

When installing an RS-485 configuration, ensure each MK2000 is connected directly to the RS-485 bus with correct polarity (see Figure 2-9).

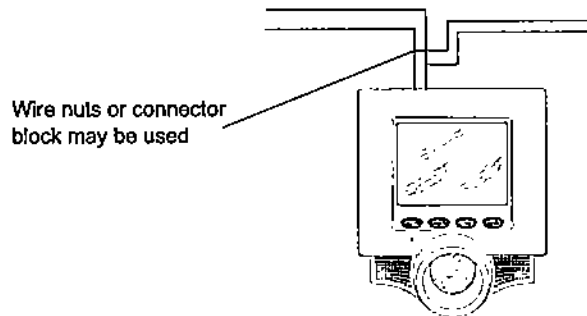


Figure 2-9. Connector Block

The cable required for an RS-485 installation should meet or exceed the following specifications:

- 1 twisted pair 26 AWG (7/34) tinned copper
- twisted pair foil wrapped - 100% coverage
- nominal impedance 120 ohms
- capacitance between twisted pair 10-25 pF per foot
- capacitance between conductors & shield 20-35 pF per foot
- DC resistance of each conductor 45 ohms per 1000 feet
- DC resistance of shield 10 ohms per 1000 feet.



If the host does not support RS-485 and RS-485 is the desired communication interface, an RS-232 to RS-485 conversion box is required. The conversion box must be sourced locally and configured per manufacture's instructions. The conversion box is not available from Symbol Technologies.

To install the MK2000 with a host that does not support RS-485:

1. Connect the conversion box to the host using an RS-232 cable.
2. Attach the RS-485 cable.
 - Connect the RS-485 cable to the LAN port on the MK2000. See Figure 1-3 on page 1-5 for port locations. Ensure the cable is terminated according to the *RS-485 Port Connections* described in *Table 2-3*.
 - Plug the other end of the RS-485 cable into the converter box.
3. When the data communications installation is completed, return to *Installation Overview* on page 2-2 and proceed with step 4, *Select optional peripherals*.

Wired RS-232 Setup

The MK2000 can communicate with a host using a serial cable connected to the Scanner/Printer (RS-232) port.

1. Connect the RS-232 serial cable to the Scanner/Printer (RS-232) port on the MK2000. See Figure 1-3 on page 1-5 for port locations. Ensure the cable is terminated according to the *Scanner/Printer (RS-232) Port Connections* pin-outs described in *Table 2-4*.
2. Plug the other end of the serial cable into the host.

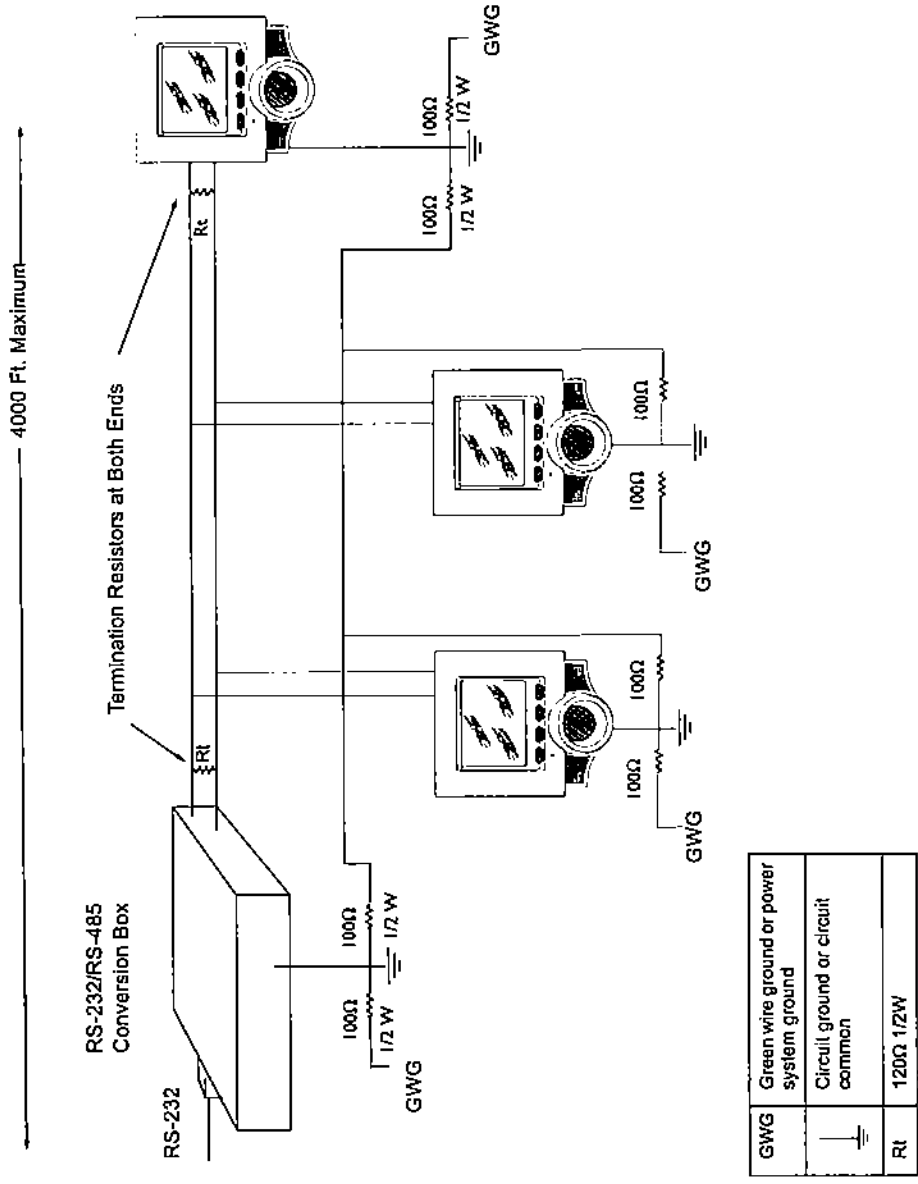


Figure 2-10. RS-485 Two-Wire Multidrop Network Example



Peripherals

The RS-232 port can be used for serial communication with a host, connection of a peripheral device like a printer or for the connection of a decoded peripheral scanner. For port locations, see Figure 1-3 on page 1-5. The Scanner/Printer (RS-232) port can also supply power (5 Vdc up to 500mA) to peripheral devices using a "virtual" COM port that enables power to the connector.

It is important to confirm the connector pin-out before attaching the cable. For connector pin-outs, refer to *Scanner/Printer (RS-232) Port Connections* on page 2-23. To connect a peripheral device:

1. Attach the peripheral device's cable to the Scanner/Printer (RS-232) port on the MK2000. See Figure 1-3 on page 1-5 for port locations. Ensure the cable is terminated properly. For *Scanner/Printer (RS-232) Port Connections* pin-outs refer to *Table 2-4*.
2. If not already connected, plug the other end of the cable into the peripheral device.

COM Port

Table 2-1. COM Port

COM	Port	Connector
COM1	RS-485	RS-485
COM4	RS-232 (no power)	Scanner/Printer
COM6	RS-232 (with 5 VDC)	Scanner/Printer

Signage

The Signage placard mounting brackets and attaching screws are provided in the Signage Mounting Kit. The mounting brackets will accommodate foam core or other material signs mounted on the MK2000, in the thickness range of 1/8" to 3/8". Refer to Figure 2-1 on page 2-3 for cutout dimensions.

Signage Mounting Kit Installation:

1. Position the mounting brackets on the back of the MK2000 as shown in Figure 2-11 on page 2-20. Attach the mounting brackets using supplied screws.

Installation

2. Trim the sign (customer provided) to 7 5/8 inch wide and 7 1/4 inches high. Refer to the dimensions shown in Figure 2-1 on page 2-3. The cutout in the sign is shown in Figure 2-12 on page 2-21.
3. Slide the sign under the mounting brackets. See Figure 2-12 on page 2-21.
4. The finished sign will be displayed as shown in Figure 2-12 on page 2-21.

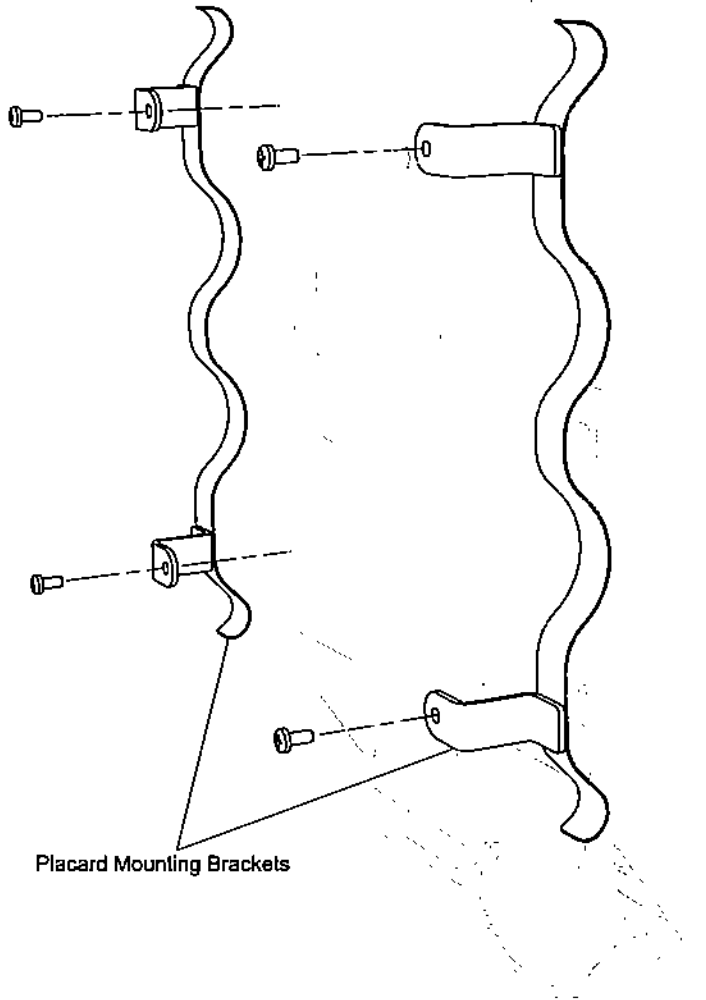


Figure 2-11. Placard Mounting Brackets, Installation

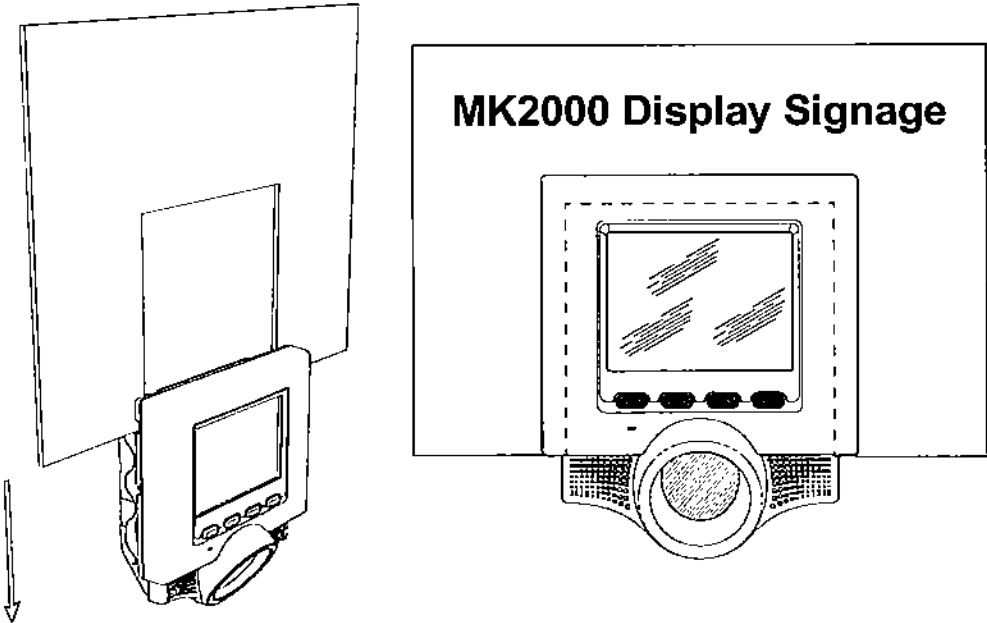


Figure 2-12. Sign Installation



Connector Pin-Outs

Table 2-2 through Table 2-4 describe the MK2000 connector pin outs. See Figure 1-3 on page 1-5 for port locations.

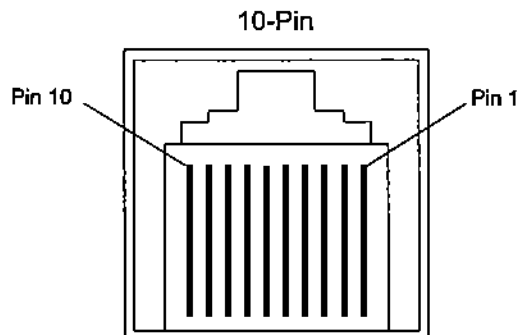


Figure 2-13. 10-Pin Connector Port

Ethernet / Bias-T Port Connections

The Ethernet connector provides the interface for both the ethernet signals and power supply voltage to the MK2000 through a single Ethernet cable. If power to the MK2000 is being provided via POE, do NOT use the Symbol AC power supply.

Table 2-2. Power-over-Ethernet Connections

Pin	Description
Pin 1	Reserved/Do not Use
Pin 2	TXD (+)
Pin 3	TXD (-)
Pin 4	RXD (+)
Pin 5*	Bias-T VCC
Pin 6*	Bias-T VCC
Pin 7	RXD (-)
Pin 8*	Bias-T GND
Pin 9*	Bias-T GND
Pin 10	Reserved/Do not Use
* Used only with Power-over-Ethernet	

RS-485 Port Connections

Table 2-3. RS-485 Connector: 10-Pin

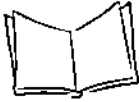
Pin	Description
Pin 1	RS-485 (+)
Pin 2	RS-485 (+)
Pin 3	Reserved
Pin 4	Reserved
Pin 5	USB PWR
Pin 6	USB -
Pin 7	USB +
Pin 8	RS-485 (-)
Pin 9	GND
Pin 10	RS-485 (-)

Scanner/Printer (RS-232) Port Connections

This connector pin-out can be used for both serial communication from the host to the MK2000 and/or communication between an external hand held decoded scanner and the MK2000. The powered Scanner/Printer (RS-232) port specification are: RJ-45 jack, 10 conductor, 5V/500mA.

Table 2-4. Scanner/Printer (RS-232) Connector: 10-Pin

Pin	Description
Pin 1	+5V
Pin 2	Not Used
Pin 3	RXD (input)
Pin 4	Not Used
Pin 5	RTS (output)
Pin 6	GND
Pin 7	CTS (input)
Pin 8	Not Used
Pin 9	TXD (output)
Pin 10	Not Used



Optional Accessories

The instructions below describe how the following optional accessories are mounted to the MK2000:

- Magnetic Stripe Reader
- RF Card

Caution

*When any of the access covers are removed, the user must follow proper ESD (Electro-Static Discharge) precautions to avoid damaging sensitive components. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions may cause damage to the MK2000 and could potentially void your warranty.

Magnetic Stripe Reader Mounting

The optional Magnetic Stripe Reader (MSR) is mounted to the MK2000 as follows:

Note: *The addition of the MSR to the MK2000 increases the total width of the MK2000 from 8.92 inches to 11.5 inches. The height and depth do not change.*

1. Place the MK2000 face down on a flat surface. Use caution not to damage the touch panel display.

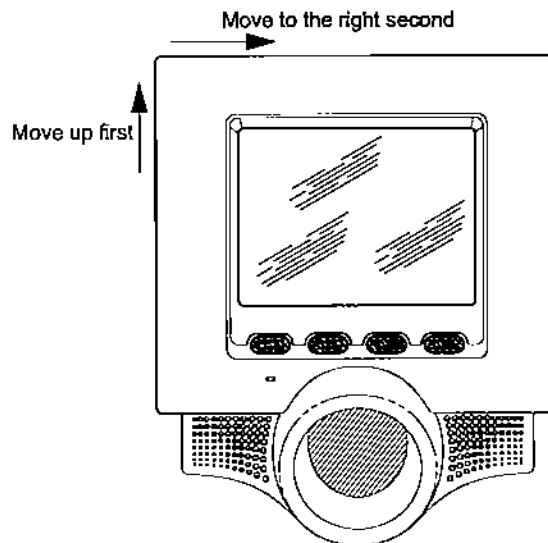


Figure 2-14. Removal Directions



2. Remove the three screws shown in Figure 2-15 from the back of the MK2000 and remove the protective cover. Retain only the screw from the protective cover. Two new (longer) screws are provided with the MSR.

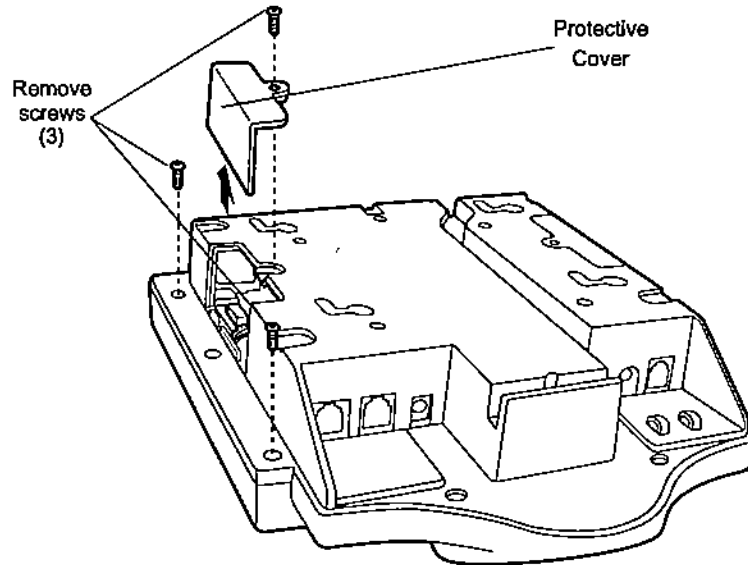


Figure 2-15. Removing the Cover and Screws

Caution

*When any of the access covers are removed, the user must follow proper ESD (Electro-Static Discharge) precautions to avoid damaging sensitive components. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions may cause damage to the MK2000 and could potentially void your warranty.

1. Connect the MSR cable connector to the MK2000 as shown in Figure 2-16.

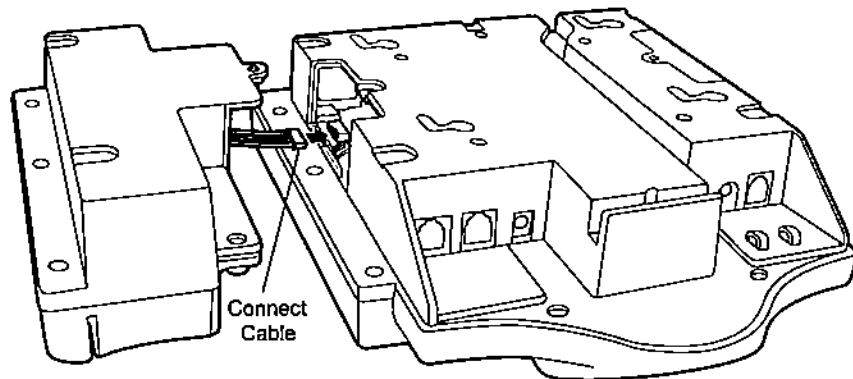


Figure 2-16. Connecting the MSR Cable to the MK2000

2. Align the MSR mounting holes with the MK2000 location as shown in Figure 2-17. Position the MSR in its mounting location.

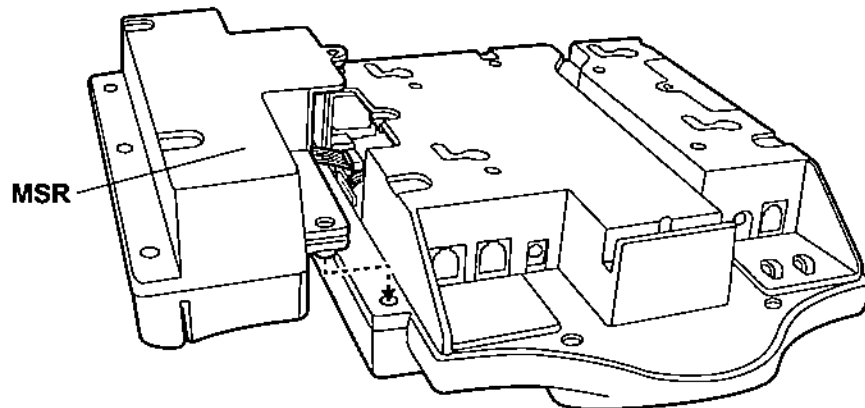


Figure 2-17. Positioning the MSR on the MK2000



3. Secure the MSR to the MK2000 as shown in Figure 2-18. Use the shorter screw previously removed and retained, and two new (longer) screws provided with the MSR.

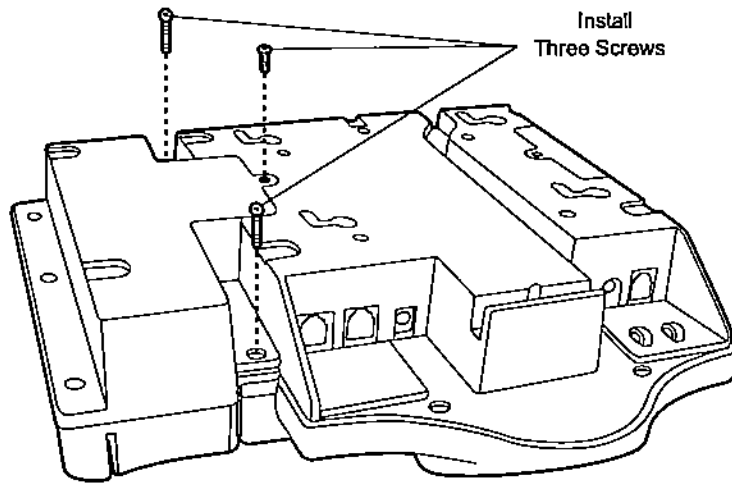


Figure 2-18. Securing the MSR to the MK2000

Figure 2-19 shows the MSR mounted to the MK2000 and ready for card reading.

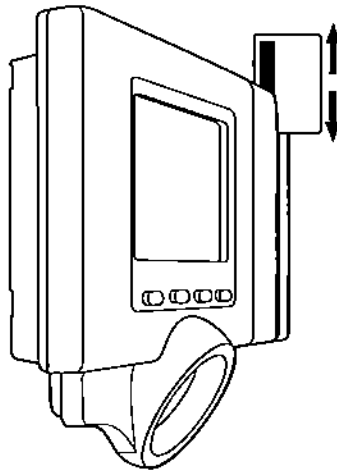


Figure 2-19. View of MSR Mounted to the MK2000

Installing/Removing RF Card

The RF Card is removed from or installed in the MK2000 as follows:

1. Place the MK2000 face down on a flat surface with the PCMCIA access cover toward you, as shown in Figure 2-20 on page 2-29. Use caution not to damage the touch panel display.
2. Remove the PCMCIA access cover.

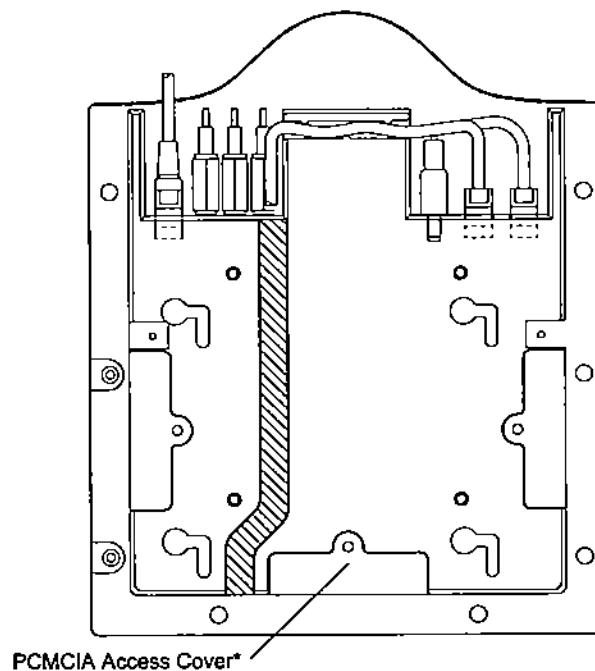


Figure 2-20. MK2000 Rear View

Caution

*When any of the access covers are removed, the user must follow proper ESD (Electro-Static Discharge) precautions to avoid damaging sensitive components. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions may cause damage to the MK2000 and could potentially void your warranty.



3. Remove the RF Card as shown in Figure 2-21.

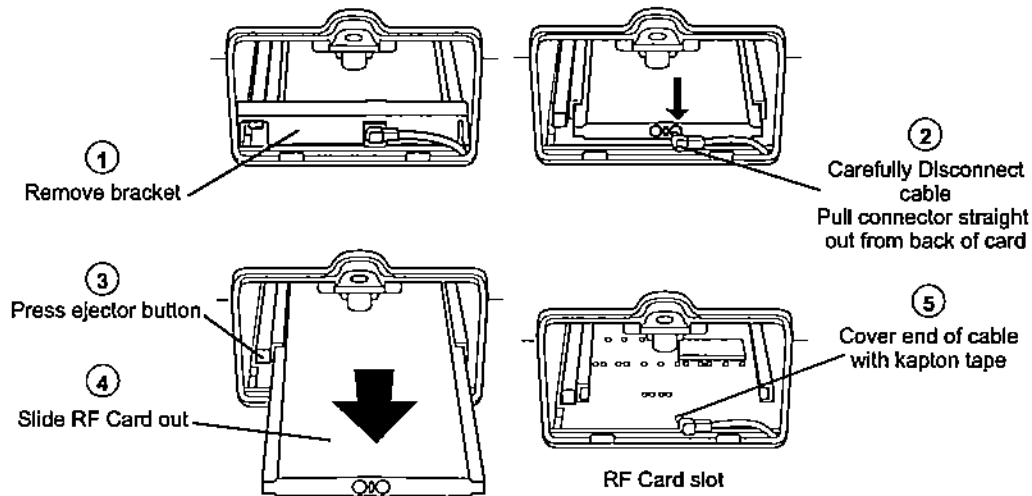


Figure 2-21. Removing the RF Card from the MK2000

4. Install the RF Card as shown in Figure 2-22.

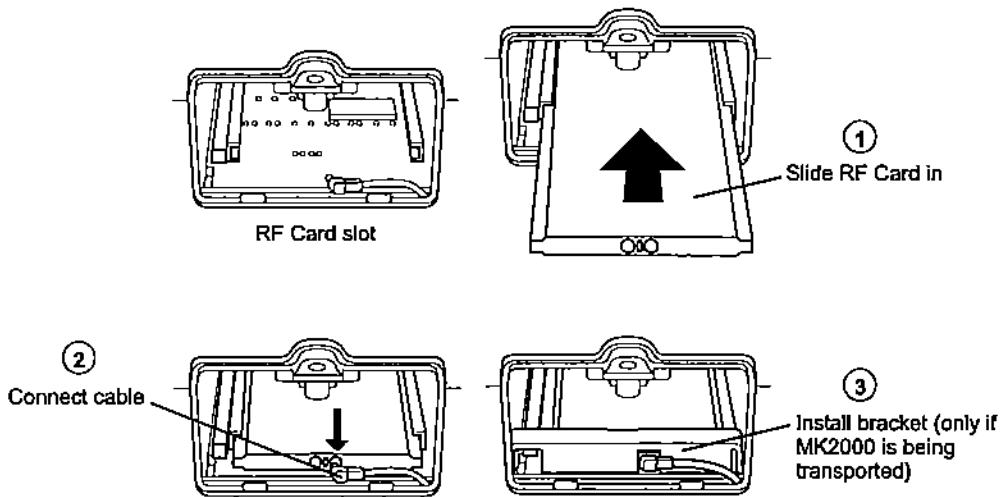
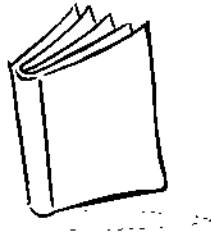


Figure 2-22. Installing the RF Card in the MK2000

5. Install the PCMCIA access cover previously removed.



Chapter 3

Setup and Configuration

Overview

This chapter describes the setup and configuration of the MK2000's applications, communications and network settings which include parameters such as the device name, internet browser settings, AirBeam related parameters, date and time setup and several other key settings.

The settings described above can be configured remotely or locally. When configured remotely, the MK2000 is set up via an Ethernet or wireless connection and no user intervention with the MK2000 is required. When configured locally, the MK2000 is set up by a user with physical access to the MK2000's touch screen.

Whether configured remotely or locally, the MK2000 uses a configuration registry file called *mkconfig.reg* to set parameters on the MK2000 and persist them between power down and power up cycles. The *mkconfig.reg* file's settings are accepted when the *mkconfig.reg* file is present in the MK2000's Application folder and the MK2000 is rebooted.

The MK2000's parameters can be set locally or remotely via one of the three methods listed in Table 3-1 on page 3-2.

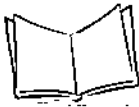


Table 3-1. Methods of Configuring the MK2000

Configuration Method	Remote	Local	Comments
Configuration Utility	X		Refer to Note 1
System Menu		X	Refer to Note 2
Control Panel		X	Refer to Note 3

Notes:

1. Using the Configuration Utility, all parameters can be configured remotely. The utility is a Windows[®] based program which runs on a host computer and generates a configuration registry file (mkconfig.reg). Once the file is loaded on the MK2000 and it is rebooted, the file automatically configures the MK2000. Refer to *Configuration Utility* on page 3-3.
2. Using the System Menu function, all configuration parameters can be set locally on the MK2000. System Menu is identical to the Configuration Utility, except that a virtual keyboard on the MK2000 is used to enter information. When System Menu is exited, the user is prompted to save the changes. Saving the changes automatically updates the configuration registry file (mkconfig.reg) and overwrites the existing settings. However, the MK2000 must be rebooted for the values to be accepted. Refer to *System Menu* on page 3-40.
3. Using the Control Panel, a limited number of parameters can be changed locally using the Control Panel function on the MK2000 Start menu. The functions listed in Table 3-9 on page 3-41 may be changed, however only the Stylus Settings/Touch Screen Calibration is recommended to be set using the Control Panel. Changes made via the Control Panel **must** be saved to the mkconfig.reg configuration file by selecting *Start/Programs/Save Configuration*, otherwise the settings will not persist across power-down and power-up cycles.
4. Since *Start-Save Configuration* and *System Menu-Save* both update the mkconfig.reg file, you must be careful if both methods are used. *Save Configuration* pulls the current parameter values from the registry and writes them to the mkconfig.reg file. *System Menu* reads the current contents of the mkconfig.reg file and allows the user to edit it, and then writes them back to the mkconfig.reg file.

Configuration Utility

The MK2000's Configuration Utility is a simple to use, menu-based Windows® utility for streamlining large and small site deployments. The utility allows a user to configure, discover, automate remote staging and monitor MK2000s.

The utility's functionality falls into five major categories:

- Generating a device configuration file
- Performing discovery (detection) of MK2000s on a network
- Managing out-of-box site staging of MK2000s
- Remote monitoring
- Remotely initiating select device functionality

The Configuration Utility (version 1.35) functionality listed above is available with the MK2000 Operating System version 1.1.

Generating Configuration Files

The Configuration Utility can generate a file which, when loaded onto an MK2000, configures the MK2000. This file (mkconfig.reg) gives a system administrator complete control to customize the MK2000's network communication settings, DHCP options, network device name, application launch sequence, browser home page, AirBEAM settings, date and time setup and much more.

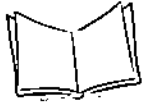
Once the file has been generated, it must be loaded onto the MK2000* and the MK2000 rebooted. Upon powering up the MK2000, the mkconfig.reg file is read and its parameters used to automatically configure the MK2000. This service uses the regmerge boot-time registry update supported by Symbol terminals for persistent storage. Refer to the MK2000 SDK documentation for "regmerge" information.

If an MK2000 with a mkconfig.reg file loses power, the parameters set within the configuration file persist and automatically re-establish at next power-up.

Note: *The mkconfig.reg file must be loaded into the Application folder (*Application*).

Performing Discovery (Detection) of Devices on a Network

The Configuration Utility discovers the IP addresses of MK2000s on a network. For discovery to occur, the host computer running the utility and the MK2000(s) must be operating on the same subnet.



When the Configuration Utility broadcasts a request for discovery, the MK2000(s) respond with their IP address. The Configuration Utility displays the IP addresses of all responding MK2000s in a list box. Refer to *Remote Devices - Info Tab: Detected Device Information* on page 3-12.

Managing Out-of-Box Site Staging of MK2000s

An mkconfig.reg configuration file can be loaded to a MK2000 either locally or remotely. The file must be copied to `\Application\mkconfig.reg`.

Remote Configuration (no local user intervention required)

The MK2000 is configured by default to use DHCP and for S24 wireless to use an ESSID of "101". If the network supports this configuration, then you can remotely configure the MK2000 as follows.

1. Connect the MK2000 to the network via a wireless or Ethernet connection.
2. Using the Configuration Utility, discover the IP address that the MK2000 has been granted (refer to *Remote Devices - Info Tab: Detected Device Information* on page 3-12).
3. Transfer the mkconfig.reg file to the MK2000's Application folder via an FTP command (specific instructions depend on your FTP software). Use the Configuration Utility to send a remote reboot command to reset the MK2000 (refer to *Action Buttons* on page 3-15).

Local configuration (local user intervention required)

Copy the configuration file to the MK2000's Application folder, then manually reboot the MK2000. The mkconfig.reg file can be copied to the MK2000 using one of the following methods:

- USB (ActiveSync 3.7) connection or
- Compact flash card.

Remote Monitoring

The Configuration Utility can be used to determine MK2000 specific information. After performing discovery, an MK2000 can be selected from the discovery list. For the selected MK2000, a connection is established between the Configuration Utility and the MK2000. The MK2000 specific information can then be selected for viewing, such as:

- **Software Version Information: Applications / drivers / OS / Platform**
Refer to *Remote Devices - Software Tab: Version Information* on page 3-14.
- **RAM and Flash Memory Usage: Total / free memory**
Refer to *Remote Devices - Storage Tab: Memory Availability and Usage* on page 3-14.
- **Hardware Information: Processor type and CPU speed**
Refer to *Remote Devices - Devices Tab: Hardware Device Information* on page 3-13.
- **Device Up Time: Displays how long an MK2000 has been operating**
Refer to *Remote Devices - Info Tab: Detected Device Information* on page 3-12.

Remotely Initiating Select Device Functionality

The Configuration Utility can be used to remotely initiate select functionality on MK2000s. After performing discovery, desired MK2000s can be highlighted from the discovery list. The highlighted MK2000s can have remote functionality initiated like launching AirBEAM Smart or rebooting the MK2000. Refer to *Action Buttons* on page 3-15.

Configuration Utility Installation

The Configuration Utility is available for download from Symbol's Developer's Zone web site (<http://devzone.symbol.com/>).

1. Download the *Configuration Utility* install file and save it on the host computer's hard drive.
2. Select *Start-Run* from the Windows® task bar.
3. Using the **Browse** button, locate the Configuration Utility install file and select **OK**.



4. The *Configuration Utility First Install Screen* welcomes the installer and provides copyright information. Select **Next** to continue.

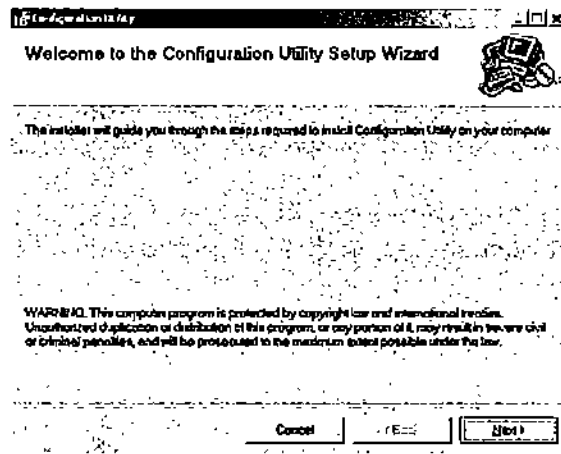


Figure 3-1. Configuration Utility First Install Screen

5. The *Configuration Utility Select Installation Folder* screen provides the installer with the directory information for the installation. Enter a new install path or accept the default path, and select the Configuration Utility users. Click **Next** to continue.

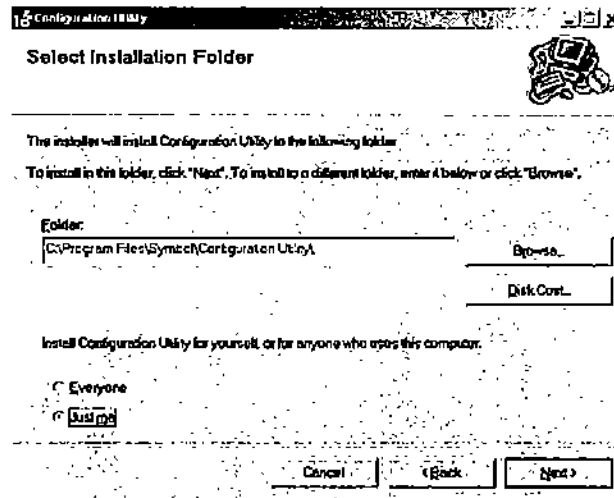


Figure 3-2. Configuration Utility Select Installation Folder

- 6. The *Configuration Utility Confirm Installation* screen allows the installer to confirm the installation. Click **Next** to continue.

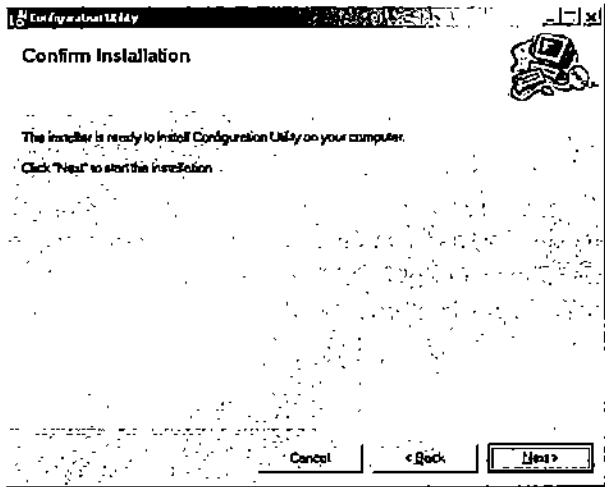


Figure 3-3. Configuration Utility Confirm Installation

- 7. The *Configuration Utility Installation Complete* screen confirms the installation was completed successfully. Click **Close** to exit.

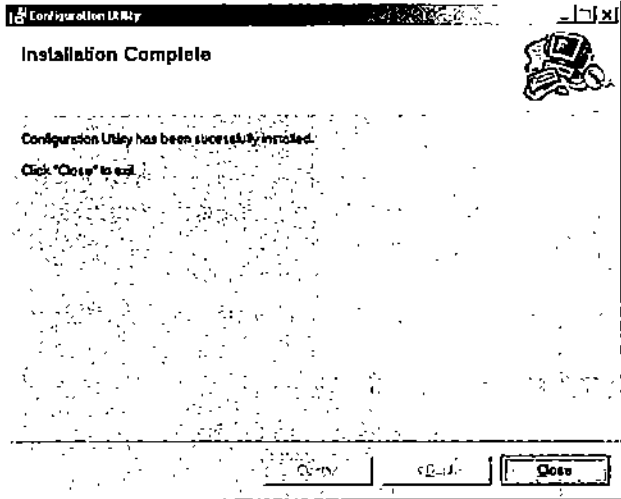


Figure 3-4. Configuration Utility Installation Complete



Configuration Utility Main Screen

The Configuration Utility main screen provides an overview of the main grouping of parameters. See Figure 3-5 on page 3-8. The main configuration category listings are:

- *Applications* - includes parameters related to Internet Explorer and Slide Show4.
- *Communications* - includes parameters related to Onboard Wired Ethernet, Spectrum24 11 Mbps and Spectrum24 2 Mbps communication settings.
- *System Configuration* - includes parameters related to MK2000 system settings such as backlight intensity, volume and sounds, date/time, button configurations, regional settings, user applications, etc.
- *Update* - includes parameters related to the onboard FTP Client and AirBeam updates.

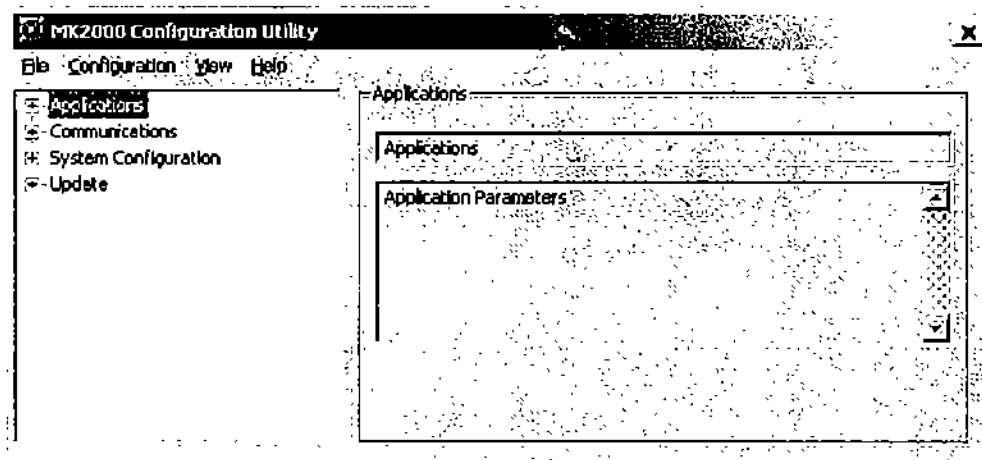


Figure 3-5. MK2000 Configuration Utility

Opening a Configuration File

Two options are available with the Configuration Utility:

- Create a new mkconfig.reg file, or
- Modify an existing file.

The file options and folder structure are described below.

Creating a New File

From the Configuration Utility on the host computer, a new mkconfig.reg file can be created. Select *File/New* from the menu bar. The first time the file is saved from the Configuration Utility after modifying parameters, choose *File/Save As* and save the .reg file in a folder on the host computer. The default file name is **newconfig.reg**. The file can be assigned any name desired, but the file must be renamed mkconfig.reg before it is transferred to the MK2000's Application folder.

Modifying an Existing File

From the Configuration Utility on the host computer, choose *File-Open* from the menu, select a file with a .reg extension and click **OK**. This loads the configuration file settings into the Configuration Utility. Modifications can then be made using the Configuration Utility. When done making modifications, choose *File-Save*. The new settings are applied to the mkconfig.reg file that was opened for modification.

Folder Structure

Two main points must be noted about the folder structure in the Configuration Utility:

- The first time the configuration file is saved from the Configuration Utility, save the mkconfig.reg file in a folder that you specify on the host computer. The next time the file is modified and saved, it is automatically saved in the last folder that you saved a file to.
- The next time you open the Configuration Utility and select *File/Open*, it automatically goes to the last folder that you saved a file to so you can select an existing file to open.

Saving a File

The information in this section describes how to save modified parameters and generate an mkconfig.reg file from the Configuration Utility and how to rename a file for downloading to the MK2000.

Save Configuration / Generate a .reg File

To save the settings after making or modifying parameters in the Configuration Utility, choose *File-Save As*. After installing the utility, the first time the save command is executed the file is saved in a folder on the host computer. The default folder is *C:\Program Files\Symbo\Configuration Utility\MK2000 Configuration Files*. The default file name is **newconfig.reg**, but the file can be renamed.



Renaming a .reg File

Once the .reg file is created configuration updates are made using the Configuration Utility. You can overwrite an existing .reg file or save it under a new name. Choose *File - Save As*, and either browse for the .reg file to be overwritten, or assign a new file name with the extension .reg.,

Renaming a .reg File for Download to the MK2000

The .reg file used to configure the MK2000 must be renamed **mkconfig.reg** before it is transferred to the MK2000's Application folder. Select *File-Open*, and select the file to download to the MK2000. Select *File-Save As*, rename the file **mkconfig.reg** and click **Save**. Refer to *Downloading the Configuration File to the MK2000* on page 3-11 for information on how to load the file onto the MK2000.

Downloading the Configuration File to the MK2000

After making changes to the Configuration File using the Configuration Utility, the `mkconfig.reg` file in the MK2000 is replaced. After downloading the file, reboot the MK2000. When the MK2000 boots, the file automatically configures the MK2000.

The file can be transported to the MK2000 using one of the following methods:

- Copy the `mkconfig.reg` file to the MK2000's Application folder via USB connection using ActiveSync (refer to *Copying the Configuration File to the MK2000 Using ActiveSync*).
- Send the file to the MK2000's Application folder via FTP (specific instructions depend on your FTP software) or AirBeam (refer to Appendix C, *AirBeam Smart*), using a wired Ethernet or wireless connection.
- Copy the `mkconfig.reg` file to a compact flash card to load it into the MK2000's Application folder.

Copying the Configuration File to the MK2000 Using ActiveSync

To copy the `mkconfig.reg` from the host computer to the MK2000's Application folder (*My Computer/Application*):

1. Connect the MK2000 to the host computer.
2. In ActiveSync on the host computer, click *Explore*. Windows® Explorer opens the Mobile Device window for the MK2000.
3. Open a new Windows® Explorer and browse the host computer to locate the file to be copied.
4. Right-click on the file and select *Copy*. Place the cursor in the Application folder on the MK2000, right-click, and select *Paste*. If an `mkconfig.reg` file already exists in the MK2000's Application folder, you are prompted to overwrite the existing file.

Rebooting the MK2000

The MK2000 must be rebooted for the `mkconfig.reg` file's parameters to take effect. Two reboot options exist:

- Remote reboot
- Local reboot.



Remote Reboot

Load the configuration file onto the MK2000 using the wired or wireless Ethernet connection, then use the configuration utility to send a command to the networked MK2000 to initiate a remote boot:

1. From the Configuration Utility main toolbar, select *View-Remote Devices*.
2. Select the *Address/Name* line of the device to be rebooted from the MK2000 Remote Devices window.
3. Click on the **Cold Boot** or **Warm Boot** button. This will initiate a remote boot.

Local Reboot

Manually reboot the MK2000 so that the *mkconfig.reg* file automatically configures the MK2000. Refer to *Gaining Access to the Windows CE Desktop* on page 6-5.

Remote Devices

The Remote Devices feature of the Configuration Utility is used to remotely monitor detailed information on MK2000s that are connected via a network connection. To access the Remote Devices window, select *View/Remote Devices* from the main toolbar of the Configuration Utility. The *Remote Devices* feature allows the user to:

- View detailed information about remote devices. Refer to *Remote Devices - Info Tab: Detected Device Information* on page 3-12.
- View a list of hardware devices for a selected device. Refer to *Remote Devices - Devices Tab: Hardware Device Information* on page 3-13.
- View a list of storage devices for a selected device. Refer to *Remote Devices - Storage Tab: Memory Availability and Usage* on page 3-14.
- View driver and application version information. Refer to *Remote Devices - Software Tab: Version Information* on page 3-14.
- Refresh the device list. Refer to Table 3-2 on page 3-15.
- Remotely perform cold and warm boots of a selected MK2000 or the entire fleet of devices on a given subnet. Refer to Table 3-2 on page 3-15.
- Launch the AirBeam application remotely. Refer to Table 3-2 on page 3-15.

Remote Devices - Info Tab: Detected Device Information

The *Remote Devices* window opens in the *Info* (default) tab as shown in Figure 3-6. The *Info* tab displays detailed identification information about the selected MK2000. Also see

Performing Discovery (Detection) of Devices on a Network on page 3-3 and Remote Monitoring on page 3-4

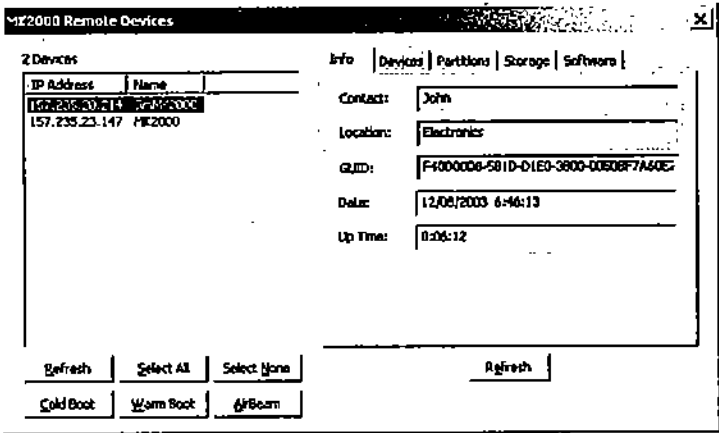


Figure 3-6. MK2000 Remote Devices - Info Tab

Remote Devices - Devices Tab: Hardware Device Information

The Devices tab displays a list of hardware devices on the selected MK2000. Also see Remote Monitoring on page 3-4.

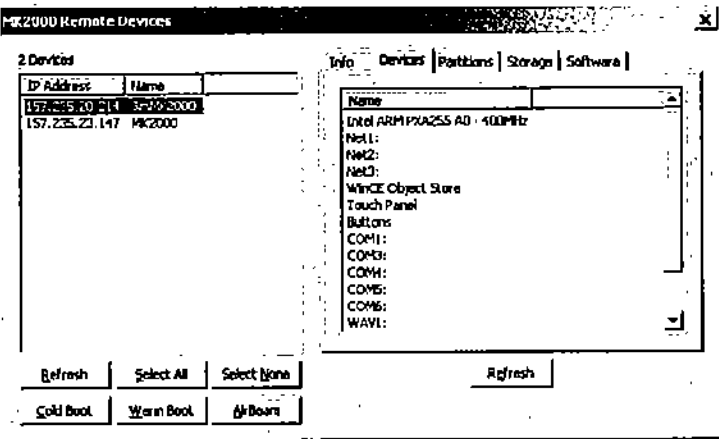
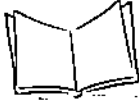


Figure 3-7. MK2000 Remote Devices - Devices Tab



Remote Devices - Storage Tab: Memory Availability and Usage

The *Storage* tab displays a list of storage areas on the selected MK2000, their physical size and available free memory. Also see *Remote Monitoring* on page 3-4.

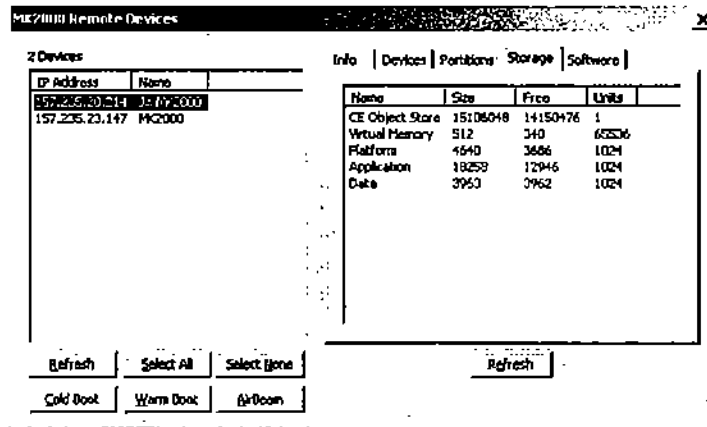


Figure 3-8. MK2000 Remote Devices - Storage Tab

Remote Devices - Software Tab: Version Information

The *Software* tab displays a list of the applications, operating system, monitor and platform, and their version information for the selected MK2000. Also see *Remote Monitoring* on page 3-4.

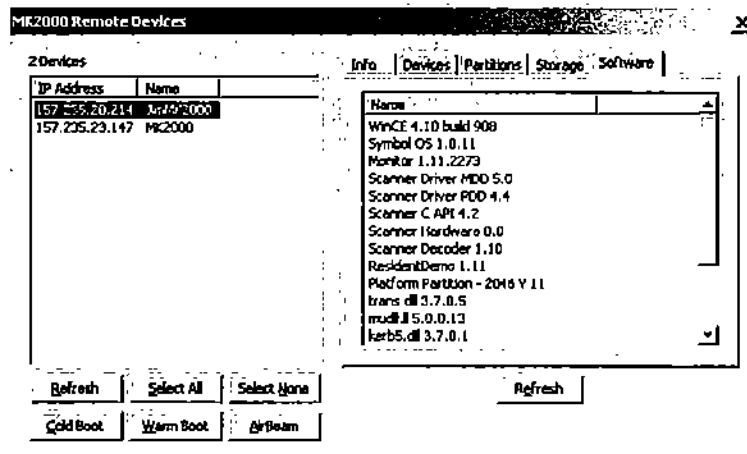


Figure 3-9. MK2000 Remote Devices - Software Tab

Action Buttons

The action buttons on the bottom left of the MK2000 *Remote Devices* window shown above can be used to perform the functions listed in Table 3-2. Also refer to *Remotely Initiating Select Device Functionality* on page 3-5.

Table 3-2. Action Buttons

Button	Function
Refresh (left side)	Clicking this button refreshes the list of MK2000s.
Select All	Clicking this button selects all of the MK2000s in the list.
Select None	Clicking this button deselects all of the MK2000s in the list.
Cold Boot	Clicking this button performs a cold boot of the selected MK2000(s).
Warm Boot	Clicking this button performs a warm boot of the selected MK2000(s).
Launch AirBeam	Clicking this button launches the AirBeam application on the selected MK2000(s).
Refresh (right side)	Clicking this button refreshes the displayed list for the selected MK2000.

Updating the Configuration Utility on Your Host Computer

Removing the Configuration Utility

Use the Windows® *Add/Remove a Program* utility to remove the Configuration Utility from the desktop computer.

Updating the Configuration Utility

Remove the Configuration Utility. To install an updated Configuration Utility version, refer to *Configuration Utility Installation* on page 3-5.



Default Parameters

The default settings that follow apply to both the Configuration Utility on a host computer and System Menu on the MK2000.

Setting Defaults Using the Configuration Utility

The Configuration Utility can be used to configure the MK2000's parameters. The default parameters are listed and described in Table 3-3, Table 3-4, Table 3-6 and Table 3-8. These tables are set up to mirror the layout of parameters in the Configuration Utility. The Configuration Utility displays parameters in the four categories listed below:

- Applications
- Communications
- System Configuration
- Update

Restoring Defaults

Some fields have a default value. To restore default values, one of two methods can be used. The default value of a single field, or the default value for all fields, can be restored by choosing appropriate menu items from the Configuration menu on the main toolbar. The two restore options are:

- *Restore Default* (restores the current single field to its original default)
- *Restore All Defaults* (restores all settings to original defaults).

Data Entry Formats

The Configuration Utility uses standard data entry formats, that depend on the data type.

- **Check Box**
The field is used for true or false values. If the check box has an "X" in it, the value is selected, otherwise it is not. Tap on the box to check or uncheck. The identified function is either applied or not applied depending on the status of the check box.
- **Text Data Entry Box**
The field requires text entries. Examples are IP address, domain name or server name.
- **Numeric Data Entry Box**
The field requires numeric entries, either in hexadecimal (base 16) or decimal (base 10) notation. Hex values must be preceded by "0x".

- **List**
The fields require the selection of a single option. The stored parameter value is likely to be different than the text displayed, so when viewing the mkconfig.reg file it may not match the selection.
- **Bit Fields**
A number of items that are presented in a list with check boxes beside each item. Multiple items can be selected (from none to all). Each selected item affects the value stored. The value stored is a single number, so the selections will not match what is in the mkconfig.reg file.
- **Multiple Text**
The fields allow multiple free-form strings to be entered. A new string is created by pressing **Enter** on the keyboard. Multiple text values are not represented in the mkconfig.reg file as text, so the value entered will not be recognizable in the mkconfig.reg file.

Applications

The first main branch of the Configuration Utility (and System Menu) is *Applications*. The default parameters are listed in Table 3-3.

Table 3-3. Application Default Parameters

Application Parameters	Description	Default
<i>Internet Explorer</i>	Internet Explorer Configuration	
Start Page	The default page for Internet Explorer.	file://\windows\mk2000.htm
Search Page	The default search page for Internet Explorer.	http://search.msn.com
Anchor Underline	An anchor or link is underlined.	no
Error Dlg Displayed On Every Error	Error dialogs come up when there is a script error.	no
Display Inline Images	Inline images in Internet Explorer are displayed.	TRUE
Play Background Sounds	Sounds are played in a page in Internet Explorer.	TRUE
Smooth Scroll	Smooth scrolling is used in Internet Explorer.	FALSE



Table 3-3. Application Default Parameters (Continued)

Application Parameters	Description	Default
Cache Limit	The cache size for Internet Explorer, in kilobytes.	512 kB (0x200 hex)
WarnOnZoneCrossing	A message is displayed when crossing from secure to unsecure in Internet Explorer.	FALSE
Secure Protocols	Configuration for security settings in Internet Explorer	TLS 1.0 disabled, SSL 2.0, SSL3.0 enabled
Slide Show	Slide Show Inactivity Application parameters	
Image Directory	The directory that contains the images to display	None
Background Color	Default color to use as background if image is smaller than screen. Format is 0BGR, where the first byte is zero, and the rest are byte values for each color.	0 (0x0 hex)
Display Duration	The duration, in seconds, to display each image before loading the next one.	0 (0x0 hex)

Communications

The second main branch of the Configuration Utility (and System Menu) is *Communications*. The default parameters are listed in Table 3-4. Immediately following the table is information about configuring DHCP Options (refer to *DHCPConfig* on page 3-22) and specifying RF settings for wireless networks (refer to *Specifying RF Settings for Wireless Network Connections* on page 3-23).

Table 3-4. Communication Default Parameters

Communication Parameters	Description	Default
<i>Onboard (Wired) Ethernet</i>	Onboard Wired Ethernet Configuration	
Default Gateway	Sets the Default Gateway for this adapter.	None
DHCP Options	Open DHCP Options dialog (refer to <i>DHCPConfig</i> on page 3-22 for editing details).	None
DHCP Server	If specified, DHCP will contact this server, otherwise it will broadcast for the server.	None
DNS Domain	The domain name for this adapter.	None
DNS Server(s)	A list of DNS servers, in the order to query.	None
Enable DHCP	Turns DHCP Address resolution on or off. If this is selected, do not set IP Address, Subnet Mask, Gateway, DNS Server(s), or WINS Server(s).	TRUE
IP Address	Sets the IP Address for this adapter.	None
Subnet Mask	Sets the subnet mask for this adapter.	None
WINS Server(s)	A list of WINS servers, in the order to query.	None
<i>Spectrum 24 802.11b</i>	Spectrum 24 802.11b Parameters.	
Default Gateway	Sets the Default Gateway for this adapter.	None



Table 3-4. Communication Default Parameters (Continued)

Communication Parameters	Description	Default
DHCP Options	Open DHCP Options dialog (refer to <i>DHCPConfig</i> on page 3-22 for editing details).	None
DHCP Server	If specified, DHCP will contact this server, otherwise, it will broadcast for the server.	None
DNS Domain	The domain name for this adapter.	None
DNS Server(s)	A list of DNS servers, in the order to query.	None
Enable DHCP	Turns DHCP Address resolution on or off. If this is selected, do not set IP Address, Subnet Mask, Gateway, DNS Server(s), or WINS Server(s).	TRUE
ESS ID	Sets the ESSID for the wireless network. (Refer to <i>Specifying RF Settings for Wireless Network Connections</i> on page 3-23 for editing details.)	101
IP Address	Sets the IP Address for this adapter.	None
Network Connect Dialog	Set to 'NOT', 'NDISUIO' to disable dialog. Leave clear to enable.	None
Subnet Mask	Sets the subnet mask for this adapter.	None
WINS Server(s)	A list of WINS servers, in the order to query.	None
Spectrum 24 2 Mbps	Spectrum 24 802.11 (2 Mbps) Parameters.	
Default Gateway	Sets the Default Gateway for this adapter.	None
DHCP Options	Open DHCP Options dialog (refer to <i>DHCPConfig</i> on page 3-22 for editing details).	None

Table 3-4. Communication Default Parameters (Continued)

Communication Parameters	Description	Default
DHCP Server	If specified, DHCP will contact this server, otherwise, it will broadcast for the server.	None
DNS Domain	The domain name for this adapter.	None
DNS Server(s)	A list of DNS servers, in the order to query.	None
Enable DHCP	Turns DHCP Address resolution on or off. If this is selected, do not set IP Address, Subnet Mask, Gateway, DNS Server(s), or WINS Server(s).	TRUE
ESS ID	Sets the ESSID for the wireless network. (Refer to <i>Specifying RF Settings for Wireless Network Connections</i> on page 3-23 for editing details.)	101
IP Address	Sets the IP Address for this adapter.	None
Subnet Mask	Sets the subnet mask for this adapter.	None
WINS Server(s)	A list of WINS servers, in the order to query.	None



DHCPConfig

Editing DHCP Options

Topics covered in this section include how to edit options and save them to the Configuration File. User familiarity with the general topic of selecting Dynamic Host Configuration Protocol (DHCP) Options is required.

DHCP requests are generally made when the adapter is first configured and then every time the Lease Period expires.

A network adapter may set DHCP Options that determine what additional data is both sent to and received from the DHCP server, if that adapter is configured for DHCP address resolution. Selecting the *DHCP Options* field opens a separate dialog box for editing the options. The dialog contains names and help text for all defined DHCP Options, according to RFC 2132.

When the DHCP Options dialog is closed, the options are included in the saved Configuration File.

The **Edit** button is used to access both the send and receive option selections. Two windows are provided, the first contains the *Available Options* selections and the second lists the options that have already been selected.

The dialog has a *Send* and a *Receive* page. Items on the *Receive* tab are selected and their information is present in the registry after the DHCP request is resolved. *Receive Options* pulls information from the server. Items on the *Send* tab must be selected into the configuration and then their value must be set. *Send Options* pushes information to the server.

To edit the DHCP Options, select the *DHCP Options* item from the appropriate adapter and click **Edit**. This opens the *DHCP Options* window where you can configure both the *Send* and *Receive* options.

From the *Send* tab, select a new option from the pull-down menu by tapping on the option. Enter any values/IP address requested or select the available options from pull-down menus and tap on the **Add** button. The selected value then appears in the *Options to Send* window. To remove an item from the *Options to Send* window reverse the procedure and click the **Remove** button. Note that when an option is removed, the data value for that option is lost and must be re-entered if the option is chosen again.

Specifying RF Settings for Wireless Network Connections

To enable a wireless MK2000 to work on an RF network, RF settings such as the Extended Service Set Identifier (ESSID) must be configured. Encryption keys may also be required to access the network. The RF settings and encryption keys can be entered via the methods outlined in Table 3-5

Table 3-5. ESSID Configuration Methods

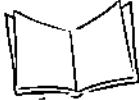
Configuration Method	Setup Method		Access to Parameters		RF Network	
	Local	Remote	RF Settings	Encryption Settings	11 Mbps	2Mbps
Configuration Utility		X	X		X	X
System Menu	X		X		X	X
Symbol Mobile Companion	X			X	X	

For a list of all RF parameters that can be set via the Configuration Utility, refer to Table 3-4 on page 3-19.

Note: Encryption keys are entered via Mobile Companion. When saved by selecting Start/Programs/Save Configuration from the MK2000 desktop, the encryption keys entered are saved in the MK2000's `mkconfig.reg` file and will persist across power-down and power-up cycles. If the encryption keys are not saved via "Save Configuration", the settings will be lost at the next power-down. Note that the encryption keys are hidden and cannot be edited in the Configuration Utility and System Menu. To properly enter encryption keys, refer to page B-7. If a new `mkconfig.reg` file is created and distributed to a customer, any RF encryption keys will need to be re-entered locally at each MK2000.

Specifying RF Settings Using the Configuration Utility

Most general purpose S24 parameters can be set using this utility, except for the encryption keys (if used), which can only be set through Mobile Companion on the MK2000. Refer to *Specifying RF Settings Using Symbol Mobile Companion* on page 3-24 or *System Configuration* on page 3-25.



When using the Configuration Utility, refer to Table 3-4 on page 3-19 and perform the following steps:

1. Select and configure the required RF settings for your network.
2. If encryption is used, refer to *Encryption* on page B-7 for an overview of the encryption options available on the MK2000.
3. Save the configuration file (refer to *Save Configuration / Generate a .reg File* on page 3-9).
4. Download the saved configuration file to the MK2000 (refer to *Downloading the Configuration File to the MK2000* on page 3-11).

Specifying RF Settings Using Symbol Mobile Companion

The RF settings for the Spectrum24 radio card are saved with the other values of the current configuration. As always, if the value is changed, save the new configuration.

To set the value perform the following steps:

1. Mobile Companion is automatically launched at power-up. After the Mobile Companion software starts, an icon will appear in the task tray. In the event that it doesn't automatically launch, you must manually launch Mobile Companion on the MK2000 by selecting *Start/Programs/Tools/S24 Event Monitor*.
2. Tap on the task tray icon and select *WLAN Profiles* from the *Mobile Companion* menu. When the *WLAN Profiles* window initially displays, two profiles appear in the *WLAN Profiles* list box. See Figure C-10.

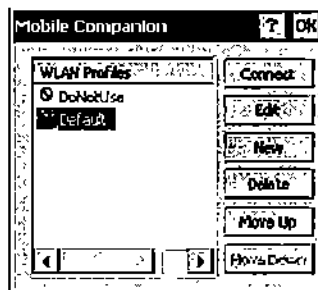


Figure C-10. WLAN Profiles

3. Select **Default** from the list box. Tap **Connect** to set **Default** as the active profile. The **Default** profile displays the transmit and receive icon to the left.
Note: Since the Configuration Utility does not support other profiles, select only the "Default" profile. Selecting any other profiles is not recommended.

4. Select **Default** from the list box and tap **Edit** to display the *Mode* tab, where the ESSID and operating mode can be changed for the **Default** profile. Use the *Encryption* tab (Figure B-5 on page B-8), *IP Config* tab (Figure B-6 on page B-10 and Figure B-7 on page B-10), and *Power* tab (Figure B-8 on page B-12) as necessary to edit the profile power consumption and security parameters.
5. Save the Mobile Companion data to ensure that it persists between power-down and power-up cycles. To save the data, select *Start/Programs/Save Configuration*.

Note: Not all parameters are saved. Refer to Table 3-4 on page 3-19.

Specifying RF Settings Using the System Menu

Most general purpose S24 settings can be made using this utility, except for the WEP encryption keys (if used), which can only be set through Mobile Companion on the MK2000. Refer to *Specifying RF Settings Using Symbol Mobile Companion* on page 3-24.

When using the System Menu, refer to Table 3-4 on page 3-19 and perform the following steps:

1. Select and configure the required RF settings for your network.
2. If encryption is used, refer to *Encryption* on page B-7 for an overview of the encryption options available on the MK2000.
3. Save the new settings by selecting *File/Save* on the System Menu utility menu bar. This replaces the existing *mkconfig.reg* file on the MK2000.

System Configuration

The third main branch of the Configuration Utility (and System Menu) is *System Configuration*. The default parameters are listed in Table 3-6. Immediately following the table is information about configuring:

- Device activity management (refer to *Device Activity Management (Sleep/Wake-up Functionality)* on page 3-34)
- Printers (refer to *Printing* on page 3-34)
- User applications (refer to *Configuring User Application(s)* on page 3-35).

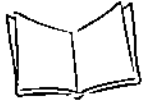


Table 3-6. System Configuration Default Parameters

System Configuration Parameters	Description	Default
Backlight	Backlight Configuration	
Brightness	Default display backlight brightness.	Bright (maximum)
Button Settings	Configuration of MK2000's four buttons. Refer to Table 6-7 on page 6-8.	
Button A	Button A default	38 (0x26 hex) Up
Button B	Button B default	40 (0x28 hex) Down
Button C	Button C default	37 (0x25 hex) Left
Button D	Button D default	39 (0x27 hex) Right
Button A and B	Button A and B default	13 (0xd hex) Enter
Button A and C	Button A and C default	194 (0xc2 hex) Shift-Tab
Button B and C	Button B and C default	0 (0x00 hex) <unmapped>
Button A, B and C	Button A, B and C default	197 (0xc5 hex) System Menu
Button A and D	Button A and D default	18 (0x12 hex) All
Button B and D	Button B and D default	9 (0x9 hex) Tab
Button A, B and D	Button A, B and D default	195 (0xc3 hex) Alt-Down
Button C and D	Button C and D default	27 (0x1b hex) Cancel/ESC
Button A, C and D	Button A, C and D default	196 (0xc4 hex) Calibration
Button B, C and D	Button B, C and D default	8 (0x8 hex) Backspace
Button A, B, C and D	Button A, B, C and D default	198 (0xc6 hex) Signal Strength
Trigger Time	Button combination trigger time, in milliseconds. Specifies the maximum time between button presses for them to be considered a combination.	200 (0xc8 hex)

Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
<i>Date and Time Settings</i>	Date and Time Configuration	
Time Zone	Standard time zone. Drop-down list of time zone names, such as "Pacific Standard Time", or "South Africa Standard Time". Select the appropriate time zone.	Pacific Standard Time.
<i>Device Activity Mgmt</i>	<p>There are three slots with identical parameters:</p> <ul style="list-style-type: none"> • First Activity Configuration • Second Activity Configuration • Third Activity Configuration <p>Refer to <i>Device Activity Management (Sleep/Wake-up Functionality)</i> on page 3-34.</p>	
Items	Devices to apply activity scheme to.	All
Days	Set of days on which to apply this activity scheme. (Choice of Monday through Sunday)	None
On Time	Time when device becomes activated. Use 24 hour clock representation.	None
Off Time	Time when device becomes deactivated. Use 24 hour clock representation.	None
<i>General</i>	General Configuration	
Name	Device Name	MK2000
Description	Device Description	None
Contact	Contact Person	None
Location	Device Location	None

**Table 3-6. System Configuration Default Parameters (Continued)**

System Configuration Parameters	Description	Default
<i>Inactivity Manager</i>	Inactivity Manager Configuration (refer to <i>Inactivity Application (Screen Saver)</i> on page 6-12)	
Inactivity Application Name	Inactivity application.	\\Windows\\SimpleSaver.exe
Idle Time Before Launch	Idle time before inactivity application is launched, in seconds.	0 (0x0 hex)
<i>Network Time Update</i>	Configuration of Simple Network Time Protocol client (refer to <i>Network Time Update: SNTP Client</i> on page 6-9 for details)	
Time Server(s)	The time server(s) to contact for updates. Servers will be tried in the order they appear. If this value is blank, the time service is disabled.	None
Run Quietly	Whether to display any messages when running. Note that setting this flag *disables* messages. Clear it to enable them.	TRUE
Retry Period	The number of seconds for which the update utility will query the time servers. This can be used as a delay to allow the network to be configured at boot time.	0 (0x0 hex)
Update Period	The frequency of time updates, in minutes. Time is relative to boot time. If service is enabled, the time will always be synchronized at boot. Set this value to zero to disable additional periodic updates.	None

Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Printer Configuration	Printer Configuration (refer to <i>Printing</i> on page 3-34)	
Active Printer	Select printer to use. Also configure the baud rate for the selected printer using the appropriate field below.	Comtec
Zebra (QL320, Cameo, Encore)	Zebra (QL320, Cameo, Encore) Printer Baud Rate	9600
Zebra (PA400)	Zebra (PA400) Printer Baud Rate	9600
Zebra (LP2824/TLP2844)	Zebra (LP2824/TLP2844) Printer Baud Rate	9600
Monarch (9450)	Monarch (9450) Printer Baud Rate	9600
Monarch (9490)	Monarch (9490) Printer Baud Rate	9600
O'Neil (MF4)	O'Neil (MF4) Printer Baud Rate	9600
Protected Mode	Gate Keeper Configuration (refer to <i>Password Protection (Gate Keeper)</i> on page 6-6)	
Password	Password required for Protected Mode access. Buttons are assigned numeric values from left to right (A=1, D=4).	44213
Application	Application to run in Protected Mode.	\\windows\\explorer.exe
Regional Settings - General	HTML in web pages will not make use of regional settings without programmatic support. To make use of regional settings, script in web pages must format dates, times, currency and numbers using built-in functions that take the regional settings into account. This is the only method of using the regional settings in a browser. C/C++/C# apps can make use of regional settings through the standard Windows CE API.	

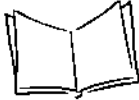


Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
<i>Regional Settings - Date</i>	Configuration of Date Regional Settings.	
Long Date	Long Date Format.	dddd, MMMM dd, yyyy
Short Date	Short Date Format.	M/d/yyyy
Short Date Separator	Character uses as the Short Date Separator.	/
<i>Regional Settings - Time</i>	Configuration of Time Regional Settings.	
PM indicator	PM indicator.	PM
AM indicator	AM indicator.	AM
Time Separator	Time Separator (generally 1 character).	:
Leading Zero	Display Leading Zero for hours/minutes/seconds.	TRUE
Time Format	Time Format	h:mm:ss tt
<i>Regional Settings - Currency</i>	Configuration of Currency Regional Settings.	
Digits In Group	The number of digits allowed in a group.	3
Grouping Symbol	Digit Grouping Symbol (generally zero or one character).	,
Digits After Decimal	The number of digits allowed after a decimal point.	2
Decimal Symbol	Decimal Symbol (one character).	.
Negative Format	Format for negative currency values. The asterisk (\"*") denotes the universal currency symbol. The period (\".") indicates the chosen decimal separator.	(*1.1)

Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Currency Symbol Position	Position of Currency Symbol. The asterisk ("*") denotes the universal currency symbol. The period (".") indicates the chosen decimal separator.	*1.1
Currency Symbol	Currency Symbol.	\$
Regional Settings - Numbers	Configuration of Number Regional Settings.	
List Separators	List Separators (character).	,
Measurement System	Measurement System.	USA
Display Leading Zero	Display Leading Zero.	TRUE
Negative Number Format	Negative Number Format. The period (".") indicates the chosen decimal separator.	-1.1
Negative Sign	Negative Sign. (generally one character).	-
Digits In Group	Number of digits in group.	3
Grouping Symbol	Digit Grouping Symbol (generally zero or one character).	,
Digits After Decimal	The number of digits allowed after a decimal point.	2
Decimal Symbol	Decimal Symbol (one character).	.
Scanner Wedge	Scanner Wedge Configuration	
Append Enter To Barcode?	Append an ENTER to the end of each barcode.	FALSE
Append Tab to Barcode?	Append a TAB character to the end of each barcode (and after ENTER, if enabled).	FALSE

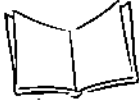


Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Trigger Mode	Whether the laser is constantly on or must be triggered manually.	Manual Trigger
Scanning Mode	Scanner raster mode	Omnidirectional - 1D only
Prefix	Text to add to beginning of barcode.	None
Suffix	Text to add to end of barcode, before tab/enter (if enabled).	None
Transmit Code ID	Transmit barcode type identifier.	None
No Shell Present	Flag that indicates that the wedge should not put an item on the system tray.	FALSE
User Apps	There are seven user application slots, with identical parameters. Each slot is under a group called "X Application Launched", where "X" is First, Second, etc. Refer to <i>Configuring User Application(s)</i> on page 3-35 for details.	
Application Path	Full path to application	\\windows\\explorer.exe
Arguments	Command line arguments for the program (will be UNICODE string).	None
Delay Before Launch	Number of seconds to delay before launching the program.	0x0
Waiting For Completion	Wait for program to complete before proceeding?	FALSE
Tethered Scanner	Tethered Scanner Configuration	
Enabled	Enables or disables the tethered scanner support. If no tethered scanner is connected, this must be disabled.	FALSE

Table 3-6. System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Scanner Model	Choose Scanner Model to support.	LS1902T
Serial Port	Serial port to which the scanner is connected.	COM6
Baud Rate	Baud rate for communications with tethered scanner. Scanner itself must be configured separately.	9600
Stop Bits	Number of stop bits in serial frame.	1
Data Bits	Number of data bits (generally 8).	8
Parity	Parity Bit configuration.	None
Intercharacter Timeout	Timeout (in milliseconds) between characters before barcode is considered complete.	200 (0xc8 hex)
Volume and Sounds	Volume and Sound Configuration.	
Default Volume	Sets the overall default volume.	Maximum
Sounds Generated By	Controls whether system events, etc. generate sounds.	Events, Applications and Notifications enabled
Screen Tap Sounds	Whether screen touches generate a sound, and, if so, what volume that sound is.	Enabled, Loud
Key Press Sounds	Whether key presses generate a sound, and, if so, what volume that sound is.	Enabled, Loud
Sound Scheme	Scheme for sounds	.DefaultSounds



Device Activity Management (Sleep/Wake-up Functionality)

The Device Activity Manager provides a facility to periodically turn off the scan engine and reduce the display backlight to a lower power consumption level in order to extend the operating life of these components. The sleep and wake-up times that can be set are flexible by day, weekday, weekend, etc.

If the Device Activity Manager has put the scan engine and/or backlight into sleep mode, it will re-power (wake-up) these subsystems for 300 seconds if a user presses one of the physical buttons, touches the display, swipes a magnetic stripe card through the MSR, or scans a barcode.

Note: *The Device Activity Manager can be set up via the Configuration Utility and/or System Menu. See page 3-27.*

Printing

The MK2000 supports printing text, barcodes and bitmaps in the following environments:

- Browser Applications
- C/C++ Applications
- C# Applications
- Visual Basic.NET Applications

Data can be transmitted to a printer by one of the following methods:

- Wired or wireless Ethernet connection (IP connected printer)
- Serial/RS-232 cable.

Serial port settings (port, stop bits, data bits, parity) are shared with the tethered scanner when it is not enabled.

Table 3-6 contains the default baud rate settings for each of the following printers:

- Zebra (QL320, Cameo, Encore)
- Zebra (PA400)
- Zebra (LP2824/TLP2844)*
- Monarch (9450)
- Monarch (9490)
- O'Neil (MF4)

Note: * Zebra LP printers are shipped from the factory set in the Gap mode. If a printer is being used in the Continuous Paper mode, the autosense does not work and the printer must be manually set to have a gap of zero. To avoid this, a command may be sent to the printer to change the mode. Consult your Zebra printer documentation for instructions on how to apply a command to accomplish this.

Advanced Printer Monitoring Functionality

For select printers, advanced printer monitoring functionality is supported on the MK2000, such as:

- Detecting if the printer is connected
- Detecting if the printer power is on
- Detecting if the printer is out of paper
- Detecting if the printer door is open (if applicable).

Configuring User Application(s)

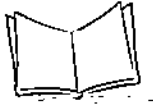
The Configuration Utility configures the launching of user application(s). There are seven application "slots" that can be defined. Each slot is processed in sequence when the MK2000 is powered up.

The Startup program supports four parameters for each slot: executable path, command line arguments, delay before running, and a special flag. Refer to Table 3-7 for descriptions of each parameter.

Programs launch one after the other with no delay, unless either *Delay Before Launch* or *Waiting For Completion* parameters are set.

Table 3-7. User Applications, Parameter Descriptions

Parameter	Description
Application Path	The <i>Application Path</i> is the full "run" path to the executable. This must be defined for the entry to be processed (i.e., do not just specify a delay). File type associations are not supported. For example if the <i>Argument</i> contains a word document then specify the full path to wordpad.exe in the <i>Application Path</i> .
Arguments	Optional. Command line arguments for the program above. Double quotation marks must be themselves escaped using a back slash character, as in \". Back slashes must also be escaped, (i.e., \\\).

**Table 3-7. User Applications, Parameter Descriptions (Continued)**

Parameter	Description
Delay Before Launch	Optional. Specifies the number of seconds to delay before launching the program. This allows a delay time to be set before launching the User Application, if a previous program needs to complete or to ensure system resources are available. This is a simplified method of handling sequencing, see <i>Reliable Sequencing of Application Programs</i> on page 3-36 to handle more complex situations (requires "wait for completion").
Waiting For Completion	Specifies whether the startup sequence should wait for this program to complete before launching the next one, typically set to FALSE. Refer to <i>Reliable Sequencing of Application Programs</i> on page 3-36 for a more detailed description.

Reliable Sequencing of Application Programs

The *Delay Before Launch* and *Wait for Completion* parameters can be used to set the startup process parameters:

- If an application requires a definitive order of execution
- To provide a signal between components to detect failures
- To verify that local or networked resources are available before the main application launches.

The *Delay Before Launch* parameter can be used to achieve a fixed delay in the launch sequence. However, this is not a robust way to ensure correct system operation. The recommended method is to write a separate program, with or without a user interface. This program should perform whatever checks are required, and then terminate, possibly setting a registry value or filesystem flag to indicate success. Set the *Wait For Completion* flag for this program and run it before running the main application(s).

For example: Use the program to confirm connection to a database server or web site that the application relies on before launching the application. This is suitable for web-based applications where lack of control over the application software limits the ability to build contingency into the startup process.

For failure recovery, the application could be set to reboot the MK2000 after a timeout was exceeded if a necessary resource became unavailable, and a startup program could check for its return, possibly presenting an "Out Of Service" screen. When the resource returns, the application would launch normally.

Update

The fourth main branch of the Configuration Utility (and System Menu) is *Update*. The default parameters are listed in Table 3-8.

Table 3-8. Update Default Parameters

Update Parameters	Description	Default
<i>AirBeam</i>	AirBeam Configuration (Refer to <i>AirBeam</i> on page 3-39)	
Auto Load	Auto Load AirBeam at boot	Do Not Autoload
Auto Retry	Specifies whether the AirBeam client will automatically retry the synchronization process if an error occurs. The value specifies the maximum number of times that the AirBeam client will automatically retry. The auto-retry feature is not supported in background mode. 0 disables, -1 means indefinitely.	-1
Retry Delay	Delay between retry attempts, in seconds.	300
FTP Server IP	IP Address of FTP server	None
FTP User	User ID to use for FTP account	None
FTP Password	Password to use for FTP account	None
Package Directory	Package Directory Configuration	None
Package 1	First Package to install	None
Package 2	Second Package to install	None
Package 3	Third Package to install	None
Package 4	Fourth Package to install	None
Package 5	Fifth Package to install	None
Package 6	Sixth Package to install	None
Package 7	Seventh Package to install	None
Package 8	Eight Package to install	None
Put Package	Put Package Option	Disabled



Table 3-8. Update Default Parameters (Continued)

Update Parameters	Description	Default
RAM Management	Enable or disable RAM Management logic.	Enabled
Suppress Separators	Enable or disable Suppress Separator logic (generally for AS400 FTP servers only).	Disabled
TFTP Download	Determines whether TFTP protocol will be used for download. If enabled, TFTP will be used, otherwise FTP will be used. NOTE: Upload of files over TFTP protocol is not supported.	Disabled
WNMS Upload	Specifies whether the AirBeam client will upload a WNMS information file at the end of each version synchronization.	Disabled
Perform In Use Test	Specifies whether the AirBeam client will perform a deferred copy of files that are in use when a download is attempted.	Disabled
Schedule Mode	Specifies whether the AirBeam client checks for new packages after reboots, at a specific time relative to midnight or at specific intervals.	On Reboots Only
Schedule Time	If schedule mode is set to time interval, this value specifies the number of minutes between checks for new packages. If schedule mode is set to time relative to midnight, this value specifies the number of minutes after midnight to check for new packages.	0

Table 3-8. Update Default Parameters (Continued)

Update Parameters	Description	Default
Schedule Prompt	Specifies whether the AirBeam client will prompt before updating a package or do the update without prompting.	Do Update if Available
FTP Server	FTP Configuration	
Allow Anonymous	Determines whether the server will allow anonymous access.	Enabled
Allow Anonymous Upload	Determines whether authorization is required for uploading files to server.	Enabled
Use Authentication	Determines whether authorization is required to connect to the server.	Disabled
Is Enabled	Determines whether the server stays loaded when it is launched.	Enabled
Root Directory	Directory and subdirectories of this key are accessible remotely. If this value is not set in the registry, the default is \Temp.	\\
User List	List of users able to access this server	None

AirBeam

AirBeam parameters can be set up remotely using the Configuration Utility. If AirBeam is set up using the Configuration Utility's mkconfig.reg file and the file is uploaded to the MK2000, this file is used to configure the AirBeam application. However, if a user configures the Airbeam client locally on the MK2000 and the changes are intended to be permanent, the user must also select the Save Configuration command (*Start/Programs/Save Configuration*). This will update the current mkconfig.reg file in the MK2000's *Application* folder. Since reg files are processed oldest to newest, the settings in \application\mkconfig.reg will take precedence over the older settings in \application\airbeam.reg.

Table 3-8 contains the default AirBeam settings.



System Menu

Setting Defaults Using System Menu

System Menu can be used to set default parameter values locally on the MK2000. The System Menu is identical in functionality and layout to the Configuration Utility's mkconfig.reg generation screen, providing local instead of remote access to the same parameters. The System Menu modifies parameters contained within the configuration file (mkconfig.reg) resident on the MK2000.

Note: Saving the System Menu configuration overwrites mkconfig.reg. The MK2000 must be rebooted for the values to be implemented.

The default parameters are listed and described in Table 3-3, Table 3-4, Table 3-6 and Table 3-8. Each of these tables lists the parameters corresponding to the main categories in the *System Menu* main screen (see Figure 3-11 on page 3-40). These tables are set up to mirror the layout of parameters in System Menu. The System Menu utility displays parameters in one of four categories listed below:

- Applications
- Communications
- System Configuration
- Update

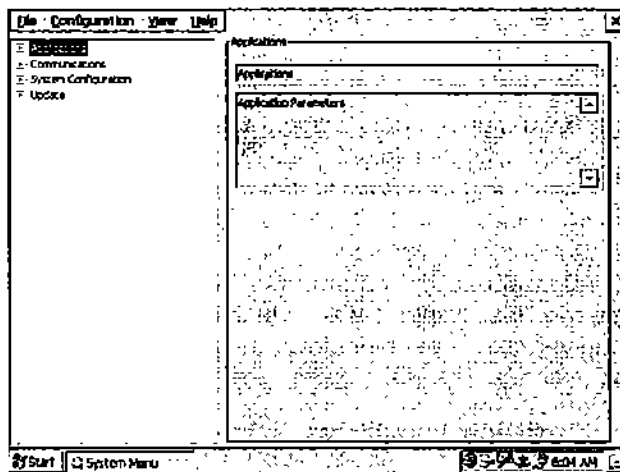


Figure 3-11. System Menu Main Screen

Control Panel Configuration Parameters

The Windows® desktop Control Panel can be used to modify certain MK2000 configuration settings, which take effect immediately. However, to store the changes and enable them to persist across power down and power up cycles, the configuration settings must be manually saved. To ensure that parameters changed via the control panel persist between power down and power up cycles, select *Start/Programs/Save Configuration* on the MK2000 to save the changes. Performing the "Save Configuration" saves the current state of all supported parameters to the mkconfig.reg file. If the changes are not saved, the MK2000 will default back to the original mkconfig.reg parameter values after the next power down - power up sequence.

It is recommended that the system menu be used for all permanent changes except recalibrating the touch screen. The configuration parameters that can be set using the Control Panel, and which can be saved to mkconfig.reg are provided in Table 3-9.

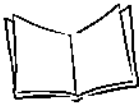
Table 3-9. Control Panel Parameters

Configuration Parameter	Reference Paragraph
<i>Backlight Settings</i>	Refer to <i>Backlight Settings</i> on page 3-41.
<i>Date and Time</i>	Refer to <i>Date and Time</i> on page 3-42.
<i>Inactivity Manager</i>	Refer to <i>Inactivity Manager</i> on page 3-43.
<i>(Gate Keeper) Password Protection</i>	Refer to <i>Gate Keeper (Password Protection)</i> on page 3-44.
<i>Volume and Sounds</i>	Refer to <i>Volume and Sounds</i> on page 3-44.
<i>Stylus/Screen Calibration</i>	Refer to <i>Stylus Settings/Touch Screen Calibration</i> on page 3-46.
<i>Regional Settings</i>	Refer to <i>Regional Settings</i> on page 3-47.

Backlight Settings

To change the backlight intensity on the MK2000:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.



3. Double-tap the *Backlight* icon from the *Control Panel* window. The *Backlight* intensity select screen appears.

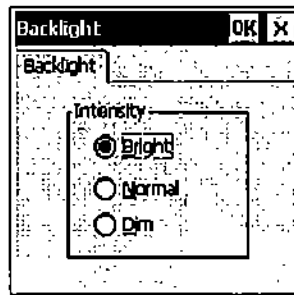


Figure 3-12. Backlight Screen

4. Select the desired intensity by tapping on the radio button.
5. Tap **OK** or **X** to close the screen to apply the selection.
6. Tap *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.

Date and Time

To set the proper date/time on the MK2000:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.
3. Double-tap the *Date/Time* icon from the *Control Panel* window. The *Date/Time Properties* screen appears.

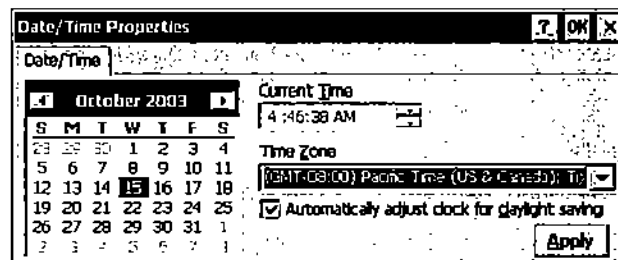


Figure 3-13. Date/Time Properties Screen

4. To set the month in the *Date/Time* tab, tap the arrows on either side of the month shown, or select the month label to choose from a list of months.

5. To select a date, tap the date in the calendar.
6. To set the current time, highlight the hours, minutes, seconds or AM/PM field in the *Current Time* field. Tap the up/down scroll arrows to change the highlighted selection.
7. To change the time zone, select it from the list labeled *Time Zone*.
8. Tap on the check box for the system to automatically adjust the clock for daylight saving.
9. Tap **Apply** to apply the new date/time settings.
10. Tap *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.

Note that the date itself is not persisted. The date always defaults to June 1, 1999, 12:00 AM, until (and if) it is updated by the SNTP Client. The only way to set the current date/time is via the control panel or SNTP Client (refer to *Network Time Update: SNTP Client* on page 6-9).

Inactivity Manager

To set up the inactivity manager:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.
3. Double-tap the *Inactivity Manager* icon from the *Control Panel* window. The *Inactivity Manager* screen appears.

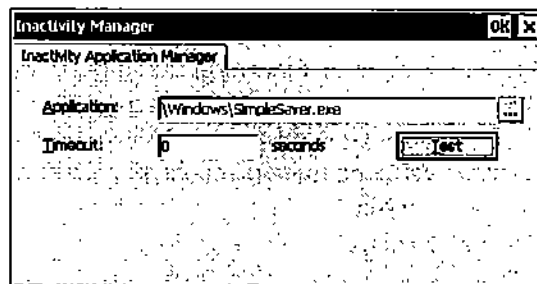

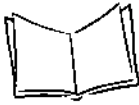


Figure 3-14. Inactivity Manager Screen

4. Select the desired application to be run during inactivity by tapping the  button. (The default application is SimpleSaver.exe.)
5. Enter the timeout desired (in seconds). The default is 0, which allows the system to run continuously without going into inactivity mode.



6. Tap **OK** to apply the timeout and application entered.
7. Tap *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.

Gate Keeper (Password Protection)

To run an application in protected mode:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.
3. Double-tap the *Gate Keeper* icon from the *Control Panel* window. The *Gate Keeper* screen appears.

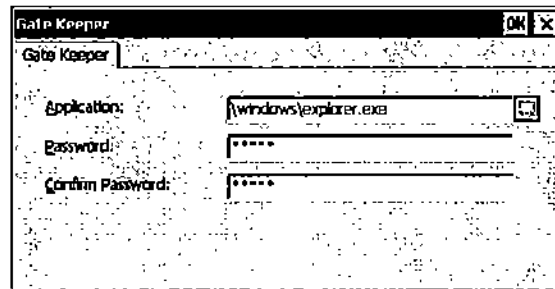



Figure 3-15. Gate Keeper Screen

4. Select the desired application to be run in protected mode by tapping the  button.
Note: It is not recommended that this application be changed. Errors in this configuration parameter or the program that is run can eliminate the ability to troubleshoot or interact with the MK2000 in protected mode.
5. Specify the password required to gain access to protected mode. Enter it twice to confirm it is entered correctly.
6. Tap **OK** to apply the changes.
7. Tap *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.

Volume and Sounds

To change the volume on the MK2000:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.

3. Double-tap the *Volume & Sounds* icon from the *Control Panel* window. The *Volume & Sounds Properties* screen appears. The *Volume* tab is the default tab.

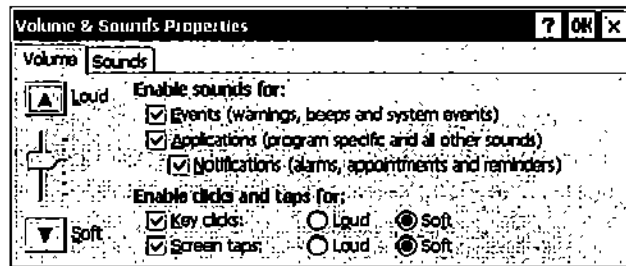


Figure 3-16. Volume & Sound Properties Screen - Volume Tab

4. Select the desired volume options using the slide bar.
5. Click the *Sounds* tab to make changes to event sounds. The *Sounds* tab appears.

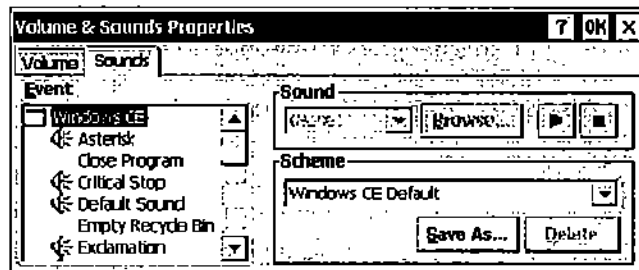


Figure 3-17. Volume & Sound Properties Screen - Sounds Tab

6. From the *Event* name list, select an event.
7. From the *Sound* list, select a sound. To remove a sound from the selected event, select *(None)*.
8. To save the changes to a different scheme, tap **Save As**, then name the sound scheme. To delete a sound scheme, select it in the *Scheme* list and tap **Delete**. To quickly turn off all event sounds, select *No sounds* from the *Scheme* list.
9. Tap **OK** to apply the selections/changes.
10. Select *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.



Stylus Settings/Touch Screen Calibration

The Stylus settings include setting the Double Tap Speed and the Calibration setting. These values are pre-configured at the factory. To recalibrate the Stylus settings:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.
3. Double-tap the *Stylus* icon from the *Control Panel* window. The *Stylus Properties* screen appears. The *Double-Tap* tab is the default tab.

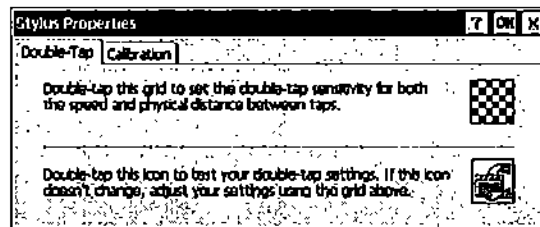


Figure 3-18. Stylus Properties Screen - Double-Tap Tab

4. Double-tap the checkerboard grid at a comfortable speed.
5. Double-tap the clipboard to test your settings. If the icon does not change, adjust the settings on the checkerboard and test your settings again. Note that the double-tap speed is not persisted across power-down and power-up cycles.
6. If the MK2000 is not responding properly to the taps, you may need to calibrate your screen. To calibrate the touch screen, tap the *Calibration* tab.

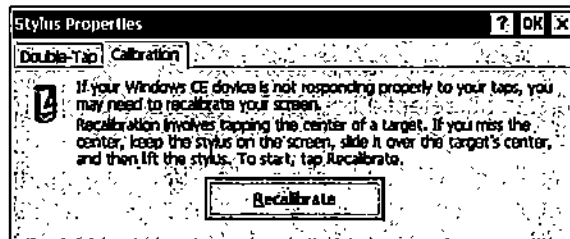


Figure 3-19. Stylus Properties Screen - Calibrate Tab

7. Tap the **Recalibrate** button and follow the directions on the screen.
Note: Another method of accessing the *Calibrate* screen is to simultaneously press buttons **A**, **C** and **D** (see Figure 1-1 on page 1-3). This command proceeds directly to the stylus calibration.

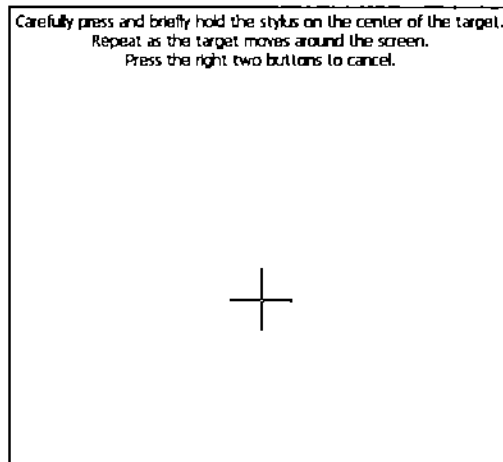


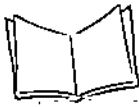
Figure 3-20. Calibrate Screen

1. The system returns to the *Stylus Properties* screen when calibration is completed. To cancel calibration, press the **C** and **D** buttons simultaneously.
2. Tap **OK** on the *Stylus Properties* screen.
Note that calibration values are stored separately from other configuration settings in a `calibrat.reg` file, and the calibration is automatically saved and persisted across power-up and power-down cycles.

Regional Settings

To set up or change regional settings:

1. Tap *Start*.
2. Tap *Settings-Control Panel*.



3. Double-tap the *Regional Settings* icon from the *Control Panel* window. The *Regional Settings Properties* screen appears. The *Regional Settings* tab is the default tab.

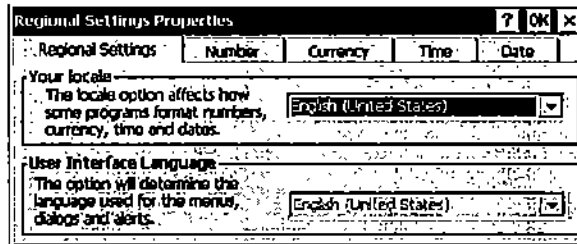


Figure 3-21. Regional Settings Properties Screen - Regional Settings Tab

4. On the *Regional Settings* tab, in *Your locale* (location), tap the drop-down arrow to select the region to be used for date, time, number, and currency formatting.
5. To change the way numbers are displayed, tap on the *Number* tab. Make the changes desired.

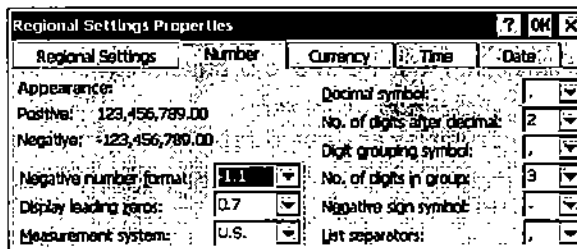


Figure 3-22. Regional Settings Properties Screen - Number Tab

6. To change the way currency values are displayed, tap on the *Currency* tab. Make the changes desired.

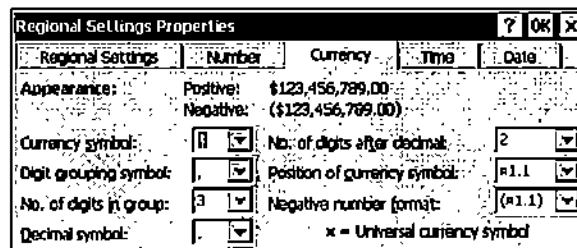


Figure 3-23. Regional Settings Properties Screen - Currency Tab

- To change the way the time is displayed, tap on the *Time* tab. Make the changes desired.

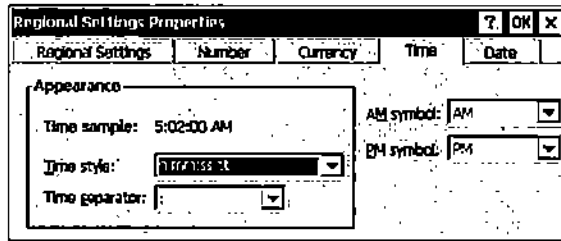


Figure 3-24. Regional Settings Properties Screen - Time Tab

- To change the way the date is displayed, tap on the *Date* tab. Make the changes desired.

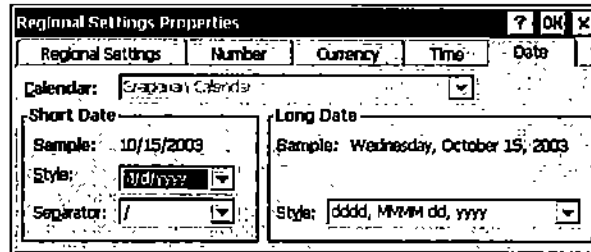
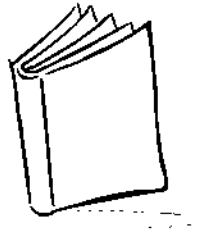


Figure 3-25. Regional Settings Properties Screen - Date Tab

- Tap *Start-Programs-Save Configuration*. This saves the new settings in the MK2000 configuration (mkconfig.reg) file.



MK2000 MicroKiosk Product Reference Guide



Chapter 4

Transferring Files to the MK2000

Introduction

The following tools can be used to copy a file or files to the MK2000:

- AirBeam Smart (refer to Appendix C, *AirBeam Smart*)
- FTP Server (refer to *FTP Server* on page 6-11)
- Compact Flash Card (refer to *Compact Flash Card* on page 4-4)
- ActiveSync.

ActiveSync

The MK2000 is capable of communicating with a host computer via Microsoft® ActiveSync Version 3.7. When communicating with a host computer, USB ActiveSync can be used to transfer data between a host computer and the MK2000.

This section provides information on installing the appropriate ActiveSync software on the host computer to enable communication between the MK2000 and the host computer.

Installing Communication Software

For the MK2000 to successfully communicate with the host computer, Microsoft® ActiveSync (version 3.7 or higher) must be installed on the host computer.



ActiveSync Software:

When installed on the MK2000, ActiveSync software:

- Allows the user to work with MK2000-compatible host applications on the host computer. ActiveSync replicates data from the MK2000 so data can be viewed, entered and modified on the MK2000 with the host application.
- Allows the user to copy and paste (rather than synchronize) files between the MK2000 and host computer.

Installing ActiveSync

To install ActiveSync on the host computer, download the latest version of the software from <http://www.microsoft.com>. Refer to the installation instructions included with the ActiveSync software.

Use ActiveSync (version 3.7 or higher) to synchronize the information on the MK2000 with the information on the host computer. Changes made on the MK2000 or host computer appear in both places after synchronization.

Note: The MK2000's implementation of ActiveSync 3.7 does not support ActiveSync Backup and Restore functionality.

Connecting the MK2000 to the Host Computer

Connect the RJ-45 connector end of the ActiveSync Developer's Cable, p/n 25-61686-01, to the RS-485 port on the MK2000 (see Figure 1-3 on page 1-5). Connect the other end of the cable to a USB port on the host computer.

Follow the instructions below to configure ActiveSync for Guest access. This is suitable for copying files between the host computer and the MK2000.

1. If the *Get Connected* window does not appear, select *Start/Programs/Microsoft ActiveSync*.

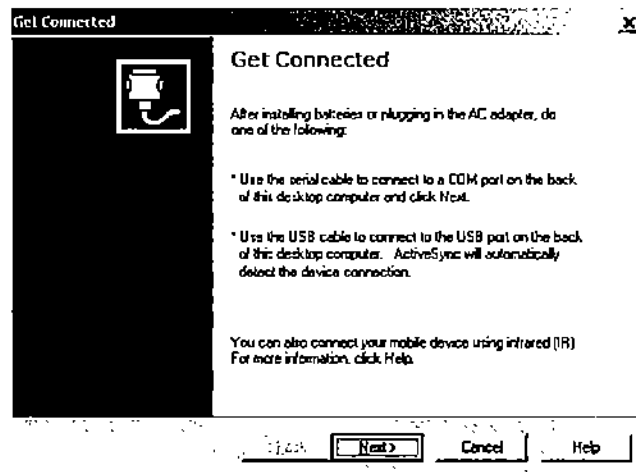


Figure 4-1. Get Connected Window

2. Connect the MK2000 to the host computer.
3. On the host computer, select **Next** in the *Getting Connected* window.
4. The host computer and the MK2000 will attempt to synchronize. The *New Partnership* window appears.

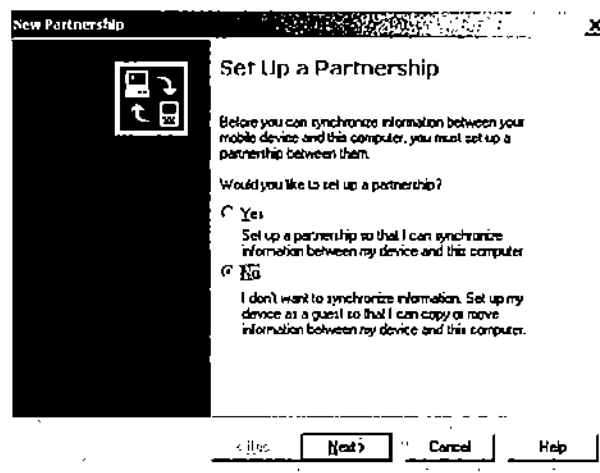
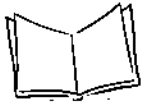


Figure 4-2. New Partnership Window



5. Click **No** and then **Next**. The *New Partnership/Name Your Device* window appears.
6. Click **Next**. The *Microsoft ActiveSync Guest Connected* window appears.

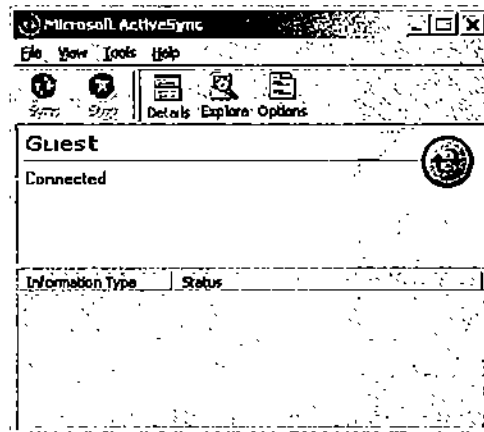


Figure 4-3. Microsoft ActiveSync Guest Connected Window

To download information (such as the `mkconfig.reg` file) from your host computer to the MK2000, copy and paste the information. Select *File-Explore* on the ActiveSync window, locate the folder to upload the information to, and paste the file.

For more information about using ActiveSync, start ActiveSync on the host computer, then refer to *ActiveSync Help*.

Compact Flash Card

Files can be copied to or from the MK2000 using a CF card. The CF card can then be used in any device capable of reading CF card data. When a Compact Flash card is added to the MK2000, it effectively adds more Flash memory.



Chapter 5

Resident Demo Application

Overview

The Resident Demo Application (MK2000RDEMOAPP-x.xx) is a browser-based application available for download from: <http://devzone.symbol.com>. The purpose of the Resident Demo Application is to provide a visual and audible demonstration of the MK2000's capabilities, in addition to providing source code to facilitate software development. The Resident Demo Application can be set to launch automatically on MK2000 boot up.

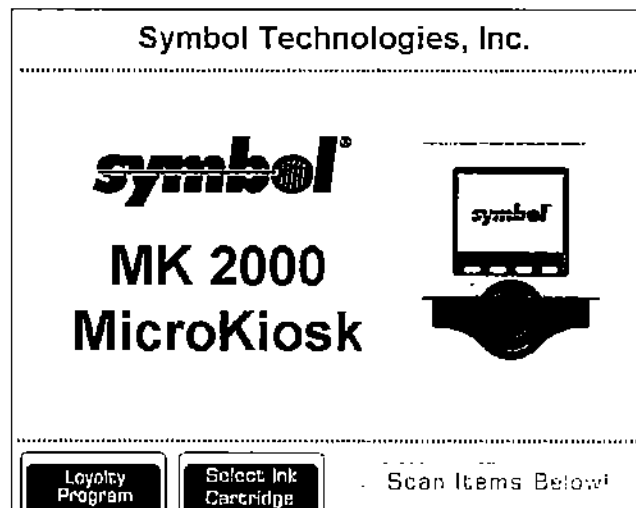


Figure 5-1. Main Screen



Resident Demo Application Functionality

The Resident Demo Application provides a visual and audible demonstration of the MK2000's capabilities. It provides an overview of a basic MK2000 retail application and it is useful in demonstrating the basic functionality of the MK2000 in a retail environment. The Resident Demo Application is functionally divided into Customer Applications and Store Operations.

The Customer Application screens provide:

- Advertising (Attract Mode)
- Price Verification
- Music Listen Station
- Alternate Language Information
- Printing Capability
- Loyalty Program.

The Store Operations screens provide:

- Video
- Item Information
- In-Store Messaging (Text, Voice and Video)
- Recording a Voicemail Response
- Voicemail Playback
- 2D bar code Scanning and Display Data
- Scan engine deactivation / reactivation.

Resident Demo Application

The Resident Demo Application is MK2000RDEMOAPP-x.xx. This application version (along with the source code) is available at: <http://devzone.symbol.com>.

The resident demo application is a self-contained program that is run on the MK2000. The Resident Demo Application does not require any external connectivity to be run.

Demo Application Bar Codes

The Demo Application bar codes are used by the Demo Application. They provide the bar code inputs required to demonstrate the MK2000's capabilities. Refer to *Demo Application Bar Codes* on page D-1.

Installing the Resident Demo Application

If you wish to install the Resident Demo Application and the MK2000 is set to automatically launch another application on power-up, refer to *Accessing the Windows® CE Desktop*.

If there is an existing copy of the Demo Application on the MK2000, perform the steps outlined in *Delete The Current Resident Demo Application Version* on page 5-3. This provides access to the Windows® CE Desktop.

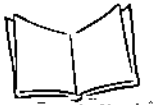
Accessing the Windows® CE Desktop

To bypass the launching of an application perform the following:

1. Perform a cold boot: Press and hold buttons **B** and **C** on the MK2000 until the display goes blank (typically 15 seconds), then release the buttons. Refer to Figure 1-1 on page 1-3. The MK2000 reboots.
2. To prevent the MK2000 from entering an application, simultaneously hold down buttons **A** and **D** just after the blue *Performing System Initialization (Phase 1)* screen appears. The **A** and **D** buttons must be held down before the message changes to *Phase 2*. Release the buttons.
3. When the Enter Password prompt appears, enter **DDBAC** and touch **OK** on the MK2000 screen, or simultaneously press the **A** and **B** buttons for Enter.
4. The MK2000 enters Protected Mode and the Windows® CE desktop appears.

Delete The Current Resident Demo Application Version

1. Double-tap the *My Computer* icon on the CE desktop.
2. Double-tap the *Application* folder.



3. Select and delete the *Resident_MK2000_Demo_App* folder.
4. Select and delete the *mkconfig.reg* file.
5. Select and delete the *ResidentDemo.reg* file.

Note: Use the delete functionality contained in the Files menu to remove the desired files.

Install A New Resident Demo Application Version

1. Create a folder on the host computer called *Demo*.
2. Download the Resident Demo Application: MK2000RDEMOAPP-x.xx located at: <http://devzone.symbol.com>. When downloading, save it to your desktop. The downloaded files are compressed in a .zip file.
3. Extract (all) files to the *Demo* folder. The following files and folders are automatically created when extracted:
 - A folder called *Resident_MK2000_Demo_App*
 - A Word document called *demo-resident.doc*
 - A .reg file called *mkconfig.reg*
 - A .reg file called *ResidentDemo.reg*.
4. To load *Resident Demo Application* onto a CF card, copy the following three items onto the CF card:
 - The folder labeled *Resident_MK2000_Demo_App*
 - The file labeled *mkconfig.reg*.
 - The file labeled *ResidentDemo.reg*.
5. Insert the compact flash card into the CF card slot in the MK2000. See Figure 1-2 on page 1-4. To access the CF card contents, use the *Storage Card* folder located in *My Computer*.
6. Double tap the *My Computer* icon.
7. Double tap the *Application* folder.
8. Use the copy function to copy the folder and files from the *My Computer\Storage Card* folder into the *My Computer\Application* folder.
9. Reboot the MK2000 to launch the new version of the *Resident Demo Application*.
10. Perform a cold boot: Press and hold buttons **B** and **C** on the MK2000 until the display goes blank (typically 15 seconds), then release the buttons. Refer to Figure 1-1 on page 1-3. The MK2000 reboots.
 - The *Resident Demo Application* launches automatically on power-up.

Disable/Restore Demo Application

1. To prevent the MK2000 from entering an application, simultaneously hold down buttons **A** and **D** just after the blue *Performing System Initialization (Phase 1)* screen appears. The **A** and **D** buttons must be held down before the message changes to *Phase 2*. Release the buttons.
2. When the *Enter Password* prompt appears, enter **DDBAC** and touch **OK** on the MK2000 screen, or simultaneously press the **A** and **B** buttons for Enter.
3. The MK2000 enters Protected Mode and the Windows® CE desktop appears.
4. Double tap the *My Computer* icon.
5. Double tap the *Application* folder.
6. Use cut function to cut the *mkconfig.reg* file from the *My Computer\Application* folder.
7. Locate the *Resident_MK2000_Demo_App* folder and double tap on the folder.
8. Paste the *mkconfig.reg* file into the *My Computer\Application\Resident_MK2000_Demo_App* folder.
9. Reboot the MK2000. The Windows® CE desktop will appear.
10. To restore the Resident Demo Application, move the *mkconfig.reg* file back to the *My Computer\Application* folder.

Note: Delete the application if freeing up storage space is a requirement.

Starting and Exiting the Resident Demo Application

Prior to launching the Resident Demo Application, print out the *Demo Application Bar Codes* on page D-1 through *2D Bar Code (PDF417)* on page D-7. The printed bar codes are required to access the MK2000 features. The Resident Demo Application can be set to launch automatically on MK2000 boot up.

For sample source code that demonstrates automatic MK2000 startup from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

To launch the Resident Demo Application automatically, apply power to the MK2000 and allow the boot sequence to proceed uninterrupted. The Resident Demo Application launches automatically.

To exit the Resident Demo Application and access the Windows® CE Desktop, refer to *Accessing the Windows® CE Desktop* on page 5-3.



Resident Demo Application Structure

The Resident Demo Application uses two categories of screens to demonstrate the MK2000 capabilities. The *Customer Application Screens* are designed to be used and accessed by customers. The *Store Operations Screens* are designed to be used and accessed only by store employees. Access to the *Store Operations Screens* is limited to employees who have their scannable bar code ID programmed into the database. Both screen sets use the 4 programmable buttons and/or virtual touch screen buttons (displayed over the four function buttons).

The *Customer Application Screens* demonstrate the customer support features.

Customer Application Screens on page 5-7:

- *Main Menu Bar* on page 5-7
- *Scanning Bar Codes* on page 5-7
- *Attract Mode* on page 5-8
- *Price Verification* on page 5-9
 - *Price Verification Menu Bar* on page 5-11
- *Printing Capabilities* on page 5-12
- *Loyalty Program* on page 5-14
- *Select Ink Cartridge* on page 5-15.

The *Store Operations Screens* demonstrate some of the types of store operations that can be supported on the MK2000.

Store Operations Screen on page 5-17:

- *Calculator* on page 5-18
- *In-Store Messaging* on page 5-19
 - *Voicemail Options Screen* on page 5-20
 - *Voicemail Playback Screen* on page 5-21
 - *Voicemail Recording and Playback Screen* on page 5-22
 - *Text Messaging Screen* on page 5-23
 - *Video Message Screen* on page 5-24
- *Scan a 2D Bar Code Screen* on page 5-25.

Customer Application Screens

Main Menu Bar

The MK2000 displays the *Main Menu* bar titles above the programmable buttons while in Attract Mode (Idle Mode).



Figure 5-2. Main Menu Bar

Scanning Bar Codes

A bar code (item's SKU, employee badge or loyalty card) can be scanned from any point within the application. However, 2D bar codes can only be scanned from the *Scan a 2D Bar Code Screen* on page 5-25. For example, after a store employee has scanned an item's SKU for price lookup and they are on the price verification screen, they can scan their employee badge to directly access the store operations menu.

For sample source code that demonstrates how to control the scan engine from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.



Attract Mode

The MK2000 Resident Demo Application automatically enters Attract Mode and displays a slide show. Attract Mode is automatically entered after a period of inactivity on any screen, the slides are displayed in preset intervals.

Slide Show (screen saver)

While the slide show displays, the *Main Menu* bar (see Figure 5-2 on page 5-7), is visible. The slides are displayed serially.

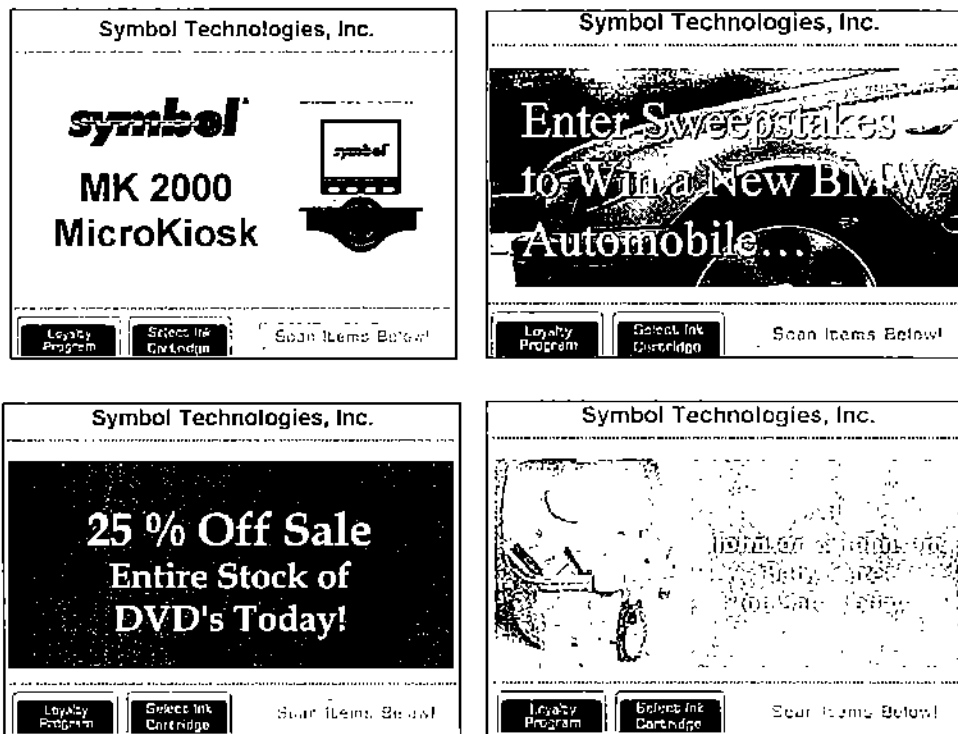


Figure 5-3. Slide Show Screens

Price Verification

The Resident Demo Application has three price verification screen formats. Samples are shown below:

- *Price Verification* screen (Loyalty Program enabled)
Requires the Loyalty Program bar code to access special Loyalty Program product information
- *Price Verification* screen (Non-Loyalty Program)
Displays standard non-Loyalty Program product information
- *Price Verification* screen (Audio Enabled).

Scan the bar code *White Correction Fluid* on page D-2:

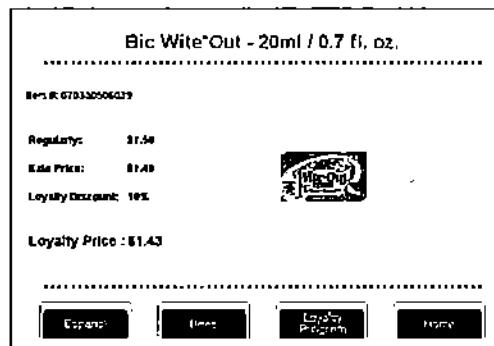


Figure 5-4. Loyalty Program Enabled, Price Verification Screen

Scan the bar code *Wide Screen TV* on page D-1:

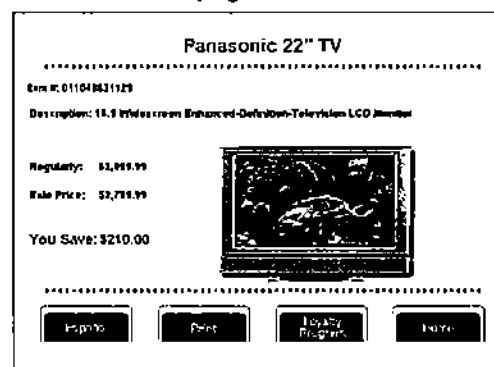


Figure 5-5. Non-Loyalty Program, Price Verification Screen



CD Listening Station

The *Audio Enabled Price Verification* screen provides an audio listening station to the price verification screen.

Select Options:

- Two volume control buttons (Louder/Quieter)
- Pause (two bar) button
- *Home*, returns to *Attract Mode* (see page 5-8).

Scan the bar code CD on page D-5:

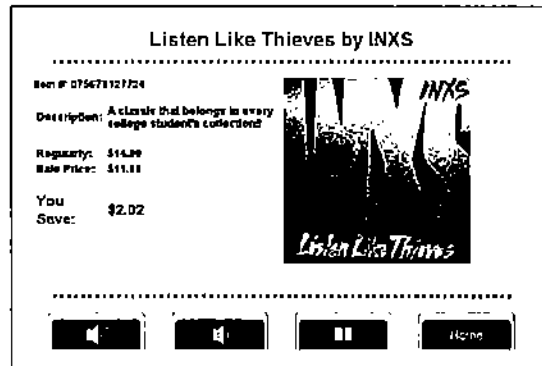


Figure 5-6. Audio Enabled Price Verification Screen

For sample source code that demonstrates volume control from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Price Verification Menu Bar

The MK2000's *Price Verification* screen uses the *Price Verification Menu* bar to identify the button functions. The *Price Verification Menu* bar appears directly over the function buttons and it identifies the button functions (while in the *Price Verification* screen).



Figure 5-7. Price Verification Menu Bar

The menu bar enables the following functionality:

- **Español** (alternate language):
 - The MK2000 Demo Application's default primary language is English, and the default alternate language is Spanish. For sample source code that demonstrates alternative language support from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.
 - On the *Price Verification* screen, the title above the first button labels the alternate language. Once selected, the alternate language remains in effect until the screen is exited or until another button is pressed.
 - Selecting the first button on the *Price Verification* screen changes the text on the screen from the primary language to the alternate language, including all screen titles, buttons titles and price verification field titles.
- **Print** - print information shown on the screen. Refer to *Printing Capabilities on page 5-12*.
- **Loyalty Program** - refer to *Loyalty Program on page 5-14*
- **Home** - returns the MK2000 to *Attract Mode* (see page 5-8).



Printing Capabilities

Selecting the **Print** button displays the *Select Printer* screen.

Select Options:

- **Print** - print barcodes, bitmaps and/or text to the selected printer.
- **Down arrow** - scroll down on the printer list
- **Troubleshoot** - selecting the **Troubleshoot** button sets the printer in a mode to print on receipt paper. The default setting is for label stock if this is not done.
- **Home** - returns the MK 2000 to *Attract Mode* (see page 5-8).

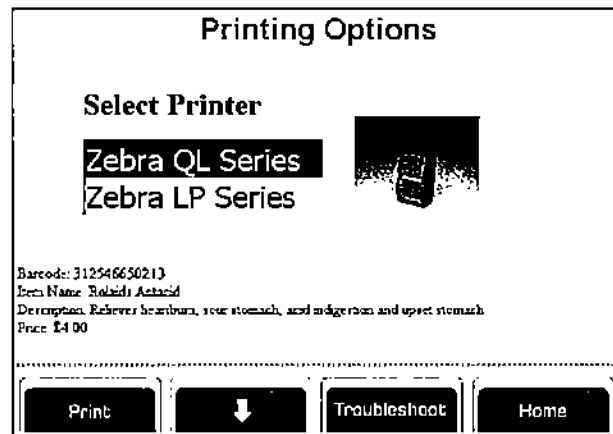


Figure 5-8. Select Printer Screen

The Resident Demo Application supports printing via the Zebra QL220/320/420 or Zebra LP2834/2844 series printers. The Demo Application also demonstrates how to print on receipt stock (continuous printing) or label stock. The QL series printers support the advanced printer monitoring functionality (refer to *Advanced Printer Monitoring Functionality* on page 3-35).

For sample source code that demonstrates printing from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Printer Errors

If an error occurs during printing, the error is highlighted in red as shown in Figure 5-9.

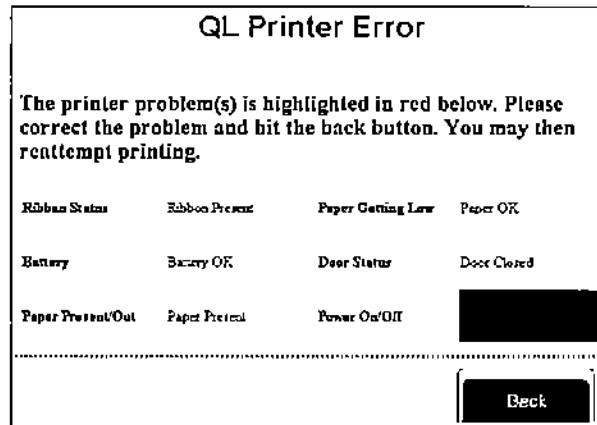
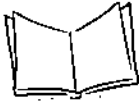


Figure 5-9. Printer Errors



Loyalty Program

Selecting the **Loyalty Program** button from the *Main Menu* bar (see page 5-7) or from the *Price Verification* screen (see page 5-9) displays the *Loyalty Program* screen.

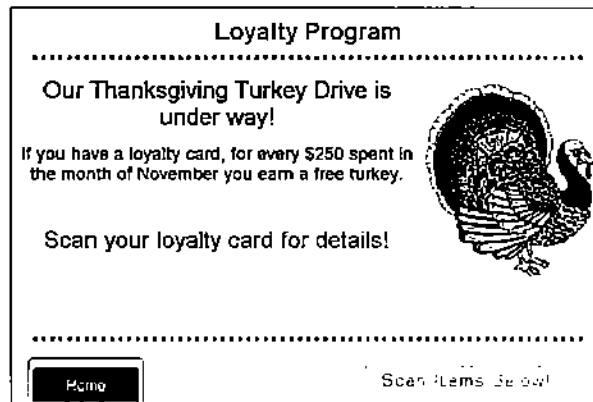


Figure 5-10. Loyalty Program Screen

Scanning the *Loyalty Program* barcode (see *Loyalty Card* on page D-7) provides details about the customer's Loyalty Program account status.



Figure 5-11. Loyalty Program Account Status

Select Ink Cartridge

Selecting the **Select Ink Cartridge** button from the *Main Menu* bar (see page 5-7) displays the *Print Cartridge* screen.

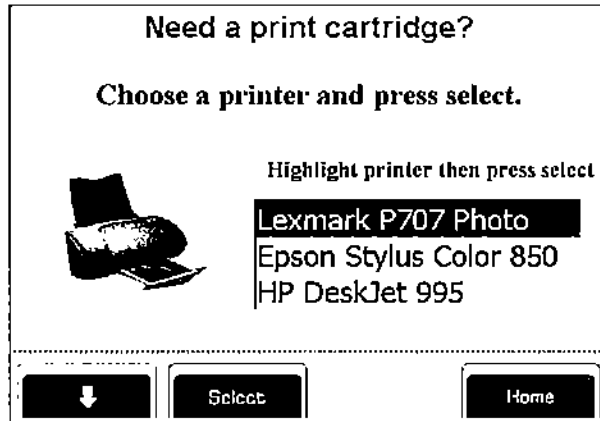


Figure 5-12. Print Cartridge Screen

Highlight one of the printers and tap or press the **Select** button. The *Cartridge Type Selection* screen appears for the selected printer.

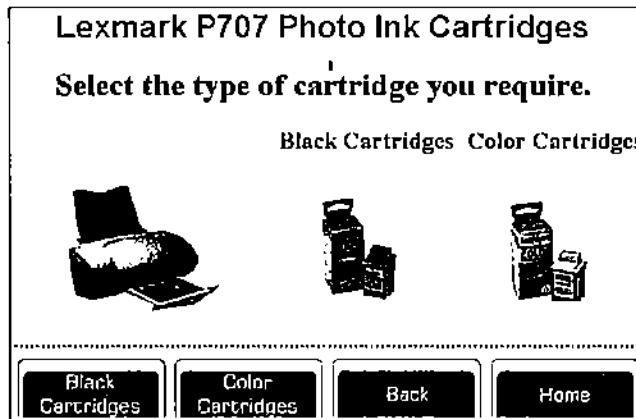



Figure 5-13. Cartridge Type Selection Screen



Select either Black Cartridges or Color Cartridges by tapping or pressing the appropriate button. The information for the selected cartridge appears on a new screen.

Lexmark P707 Photo Ink Cartridges

Item	Description	Price
 15M0120	High Resolution ink produces brilliant photos and sharp images. Microscopic ink drop size for incredible clarity and detail. Concentrated dye based inks for vibrant colors. Fade resistant to protect your favorite photos.	\$37.99

BackHome

Figure 5-14. Cartridge Information Screen

Store Operations Screen

Scan an employee badge (5 digit code 128) to enter the *Store Operations* mode (refer to *Employee Badge* on page D-6). A detailed description of each of the button functions available from the *Store Operations* screen is provided below. While on this screen, the internal scan engine is disabled.

The *Store Operations* menu bar displays the following button titles:

- **Calculator** (see page 5-18)
- **Messages** (see page 5-19)
- **Scan 2D** (see page 5-25)
- **Home** - returns the MK2000 to *Attract Mode* (see page 5-8).

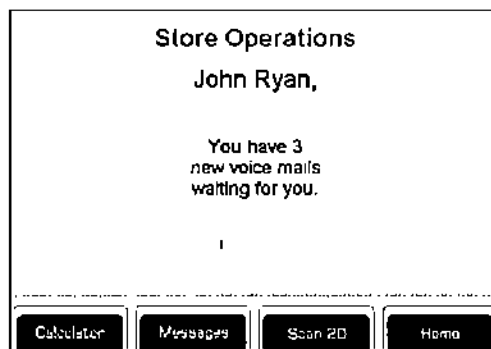


Figure 5-15. Store Operations Screen



Calculator

Selecting the **Calculator** button displays an on-screen calculator.

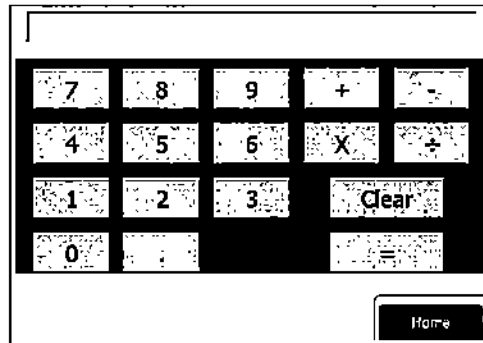


Figure 5-16. Calculator

This screen and associated source code demonstrate an ideal button layout, taking into account an average user's finger width. If a stylus is used, the 6.4 inch VGA screen can accommodate an alphanumeric keypad layout.

For sample source code that demonstrates numeric keypad operation from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

In-Store Messaging

Selecting In-Store Messaging from the *Store Operations Screen* on page 5-17 displays the *In-Store Messaging* screen (Figure 5-17 on page 5-19). When the screen is initially displayed, the first (most recently received) item is highlighted. The *In-Store Messaging* view menu bar indicates the current button functions. The *Up* and *Down* buttons are used to scroll the message list. While the scroll bar is on a message, the information displayed in the row is highlighted. Selecting a *Voicemail* message displays the *Voicemail Options Screen* (see page 5-20). Selecting a *text* message (in this demo "Employee Bulletin") displays the *Text Messaging Screen* (see page 5-23). Selecting a *video* message (in this demo "Training Video") displays the *Video Message Screen* (see page 5-24).

Select Options:

- Up arrow - scroll up on the Item list
- Down arrow - scroll down on the Item list
- Open - select an item on the Item list and proceed to either the *Voicemail Options Screen* (see page 5-20), the *Text Messaging Screen* (see page 5-23) or the *Video Message Screen* (see page 5-24) (depending on the message type)
- Home - return to the *Store Operations Screen* (see page 5-17).

In-Store Messaging				
Item	Type	From	Sent	New
1.	Employee Bulletin	Human Resources	6/15/02 1:15PM	X
3.	Voicemail	Mike Harris	5/10/02 10:10AM	
4.	Training Video	Human Resources	6/15/02 10:10AM	X

Navigation buttons: Up arrow, Down arrow, Open, Home

Figure 5-17. In-Store Messaging Screen



Voicemail Options Screen

Selecting a voicemail item from the *In-Store Messaging* screen displays the *Voicemail Options* screen (see Figure 5-18). The *Voicemail Options* screen is used to listen or respond to a voice message.

Select Options:

- Right pointer - play the message
- **Reply** - allows a user to record a message and play it back for review by entering the *Voicemail Recording and Playback Screen* (see page 5-22)
- **Delete** - delete the message
- **Back** - return to the previous messaging screen.

Voicemail Options				
Item	Type	From	Sent	New
1.	Voicemail	Rob Johnson	6/20/02 3:24PM	X

.....

▶ Reply Delete Back

Figure 5-18. Voicemail Options Screen

Voicemail Playback Screen

Selecting an item from the *Voicemail Options* screen displays the *Voicemail Playback* screen (see Figure 5-19). The *Voicemail Playback* screen is used to listen to and/or reply to a message.

Select Options:

- First speaker button - increases volume
- Second speaker button - decreases volume
- Double bar button - pauses the recorded message
- Square button - return to the *Voicemail Options Screen* on page 5-20.

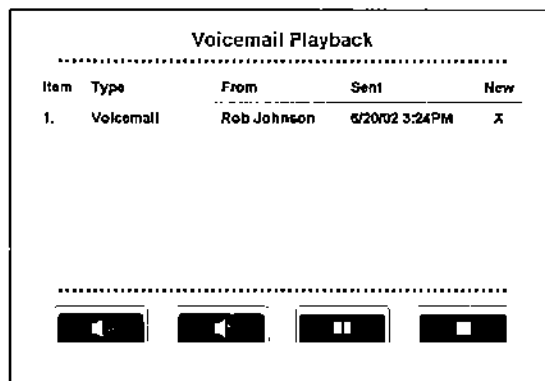


Figure 5-19. Voicemail Playback Screen



Voicemail Recording and Playback Screen

Selecting *Reply* from the *Voicemail Options* screen displays the *Voicemail Response* screen (see Figure 5-20). The *Voicemail Response* screen is used to record a voice mail reply using the MK2000's built in microphone (see Figure 1-1 on page 1-3). This screen can be used to record a message and play the message back.

For sample source code that demonstrates audio recording using the microphone from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Select Options:

- **Record** button - press and speak into the microphone to record a reply message. A .wav file is recorded using the MK2000's ActiveX object. The text on the button changes to **Stop**. Press the **Stop** button to end recording. The text on the button changes back to **Record**.
- Right pointer - play the recorded .wav file message
- **Send** - sends the message
- **Back** - return to the *Voicemail Options Screen* (see page 5-20).

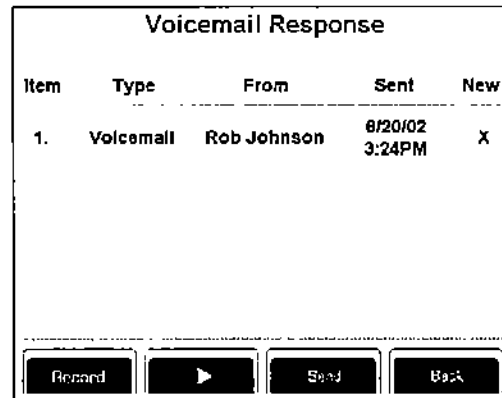


Figure 5-20. Voicemail Response Screen

Text Messaging Screen

Selecting a text based message item from the *In-Store Messaging* screen displays the *Text Messaging* screen (see Figure 5-21). The *Text Messaging* screen is used to view a text based message.

Select Options:

- **Delete** - Returns to the *In-Store Messaging* (see page 5-19).
- **Back** - Returns to the *In-Store Messaging* (see page 5-19).

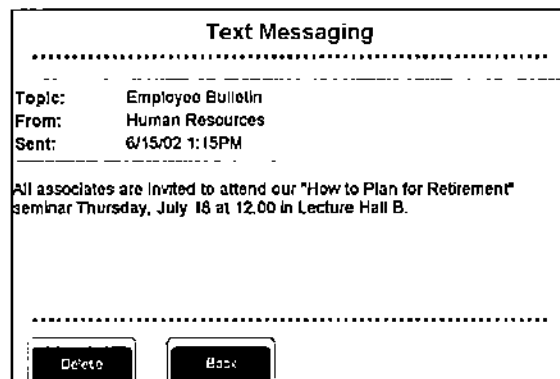


Figure 5-21. Text Messaging Screen



Video Message Screen

Selecting a (training) video item from the *In-Store Messaging* screen displays the *Video Message* screen (see Figure 5-22). The *Video Message* screen is used to view a training or informative video.

Select Options:

- First speaker button - increases volume
- Second speaker button - decreases volume
- Double bar button - pauses the video message
- Square button - returns to the *In-Store Messaging* screen (see Figure 5-17 on page 5-19).



Figure 5-22. Video Message Screen

For sample source code that demonstrates playing video files from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Scan a 2D Bar Code Screen

Selecting *Scan 2D* from the *Store Operations Screen* (see page 5-17) displays the *Scan a 2D Bar Code* screen (see Figure 5-23). The *Scan a 2D Bar Code* screen allows store associates to read a 2D bar code such as a PDF or composite code. Refer to sample *2D Bar Code (PDF417)* on page D-7.

After selecting the *Scan 2D* button, the scanning mode (laser scan pattern) is switched from omni-directional (cyclone) 1D scanning mode to 2D scan mode. When a 2D bar code is scanned and decoded, the MK2000 beeps and displays the bar code data.

Tap or press the **Home** button to return to the *In-Store Messaging* (see page 5-19).

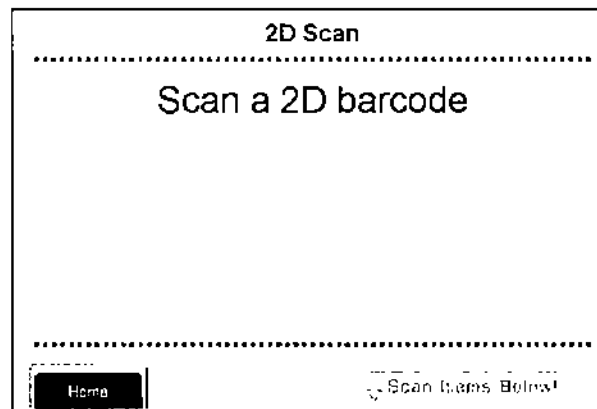
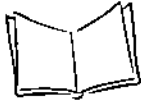


Figure 5-23. Scan a 2D Bar Code Screen



Source Code Index

Sample source code for the following functionality is outlined in the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Screen Layout

- Touch screen "click" sound control
 - How to deactivate the click sound on the screen except where a button is located
 - How to enable a button to have a click sound
- Alternate language support
 - How to display screen text in Spanish versus English
- Numeric Keypad Operation
 - How to setup a numeric keypad
- How to Hide the Browser toolbars
 - Internet Explorer toolbar
 - Windows® CE Start bar
- How to setup a Price Verification Screen
 - How to route UPC data
 - How to layout item pricing information on a screen
- How to Dynamically relabel the buttons
 - Press button on screen takes you to new screen and new button with new titles

Printing

- Printing
 - Bitmap
 - Barcode
 - Text
- QL printer error handling

Scan Engine

- Scan engine control
 - Turning the engine on
 - Turning the engine off

- Switching between omni to 2D
- Switching between 2D to omni
- Embedding the Active X object in a hidden frame
- Routing barcode data via Symbology type to different locations

Multi-Media Content

- Microphone control
 - Recording using microphone
 - Playback of recorded message
- Playing audio files
 - How to call media player
 - How to control the volume while file is being played
 - Pausing playback
- Video
 - How to play a video with media player
 - How to hide the toolbars (pause, play buttons, etc.)
 - How to control the volume while file is being played
 - Pausing playback

Advertising

- Attract loop
 - How the loop works
 - How to change the amount of time each image is displayed
 - Where images should be located

Device Startup

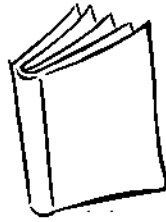
- How to enable automatic device setup
 - See demo application's mkconfig.reg file

Application Version Tracking

- How to track the demo applications version information
 - See "ResidentDemo.reg" file



MK2000 MicroKiosk Product Reference Guide



Chapter 6 System Features

Overview

Table 6-1 lists the system features covered in this chapter, and the page they first appear on.

Table 6-1. System Feature Reference

Topic	Reference Paragraph
SNMP Based Remote Monitoring	Refer to <i>SNMP Based Remote Monitoring</i> on page 6-2.
Accessing the Windows® CE Desktop	Refer to <i>Accessing the Windows® CE Desktop</i> on page 6-5.
Password Protection (Gate Keeper)	Refer to <i>Password Protection (Gate Keeper)</i> on page 6-6.
Remapping Buttons	Refer to <i>Remapping Buttons</i> on page 6-6.
Button Remapping - Keycode Values	Refer to <i>Button Remapping - Keycode Values</i> on page 6-8.
Network Time Update: SNTP Client	Refer to <i>Network Time Update: SNTP Client</i> on page 6-9.
FTP Server	Refer to <i>FTP Server</i> on page 6-11.
Inactivity Application (Screen Saver)	Refer to <i>Inactivity Application (Screen Saver)</i> on page 6-12.



Table 6-1. System Feature Reference (Continued)

Topic	Reference Paragraph
Browser Applications - Hiding Toolbars	Refer to <i>Browser Applications - Hiding Toolbars</i> on page 6-14.
Browser Applications - Handling Network Disconnects	Refer to <i>Browser Applications - Handling Network Disconnects</i> on page 6-14.
Input Panel	Refer to <i>Input Panel</i> on page 6-16.
Microsoft WordPad	Refer to <i>Windows Media Player</i> on page 6-19.
Windows Media Player	Refer to <i>Windows Media Player</i> on page 6-19.
Internet Explorer	Refer to <i>Internet Explorer</i> on page 6-20.

SNMP Based Remote Monitoring

The MK2000 supports the Simple Network Management Protocol (SNMP). An SNMP agent is provided on board the MK2000. The MK2000 supports two Management Information Bases (MIBs):

- The MK2000 extends Microsoft's implementation of the MIB-II defined Host Resource MIB to report software versions, file system values, partition table values and a few miscellaneous items.
- A custom MIB is used to perform actions such as rebooting the MK2000.

Most of the MIB-II and Host Resource MIBs are supported using Microsoft's default implementation.

Details of the supported portions of the MIB-II and Host Resource MIB (HRMIB) are not included here, except for the specific changes to the HR MIB made for the MK class of products.

The software versions are published using tables within the hrSWInstalledTable table, which is part of the Host Resource MIB. The filesystem information is presented in hrStorageTable. Refer to *List of Reported Software Component Versions* on page 6-3 for more information on what is reported using the Host Resource MIB.

The MicroKiosk line of products use the SysOID (System Object Identifier) listed in Table 6-2. This OID is the prefix for all OIDs in the MK Custom MIB.

Table 6-2. SysOID

Product	SysOID
MK 2000	.1.3.6.1.4.1.388.10.3

These SysOIDs come from the tree that has been officially assigned to Symbol Technologies (.1.3.6.1.4.1.388) and have been registered with the body within Symbol that manages our SNMP OIDs.

List of Reported Software Component Versions

The following items are reported by the Host Resource MIB. The "Where" column describes where in the Host Resource MIB this information can be found. This information may be viewed using the Configuration Utility. Refer to *Remote Monitoring* on page 3-4.

Table 6-3. Reported Software Component Versions

Item	Where
Symbol OS	hrInstalledSoftware
Windows CE OS	hrInstalledSoftware
Monitor/IPL	hrInstalledSoftware
Scanner C API	hrInstalledSoftware
Scanner Driver MDD	hrInstalledSoftware
Scanner Driver PDD	hrInstalledSoftware
Scanner Decoder Firmware	hrInstalledSoftware
Scanner Hardware	hrInstalledSoftware
Radio Driver	hrInstalledSoftware
Radio Firmware	hrInstalledSoftware
Radio Hardware	hrInstalledSoftware
N User Application names/ versions	hrInstalledSoftware
Processor Name/Type	hrDeviceTable



Table 6-3. Reported Software Component Versions

Item	Where
RAM Size	hrDeviceTable
Flash Size	hrDeviceTable
Other devices	hrDeviceTable
Partitions - name/size (Platform, Application, Data, Object Store)	hrPartitionTable
Filesystem Information	hrStorageTable

User Application Version Reporting

User applications can have their name and version information reported via SNMP as follows:

A file (suggested name is application_name.reg) is created and loaded into the MK2000's Application partition (folder). When the .reg file is read at boot up, its contents are loaded into a MK2000 registry key, HKEY_LOCAL_MACHINE\Software\AppVersions.

All values under that key represent software components. Each value/data pair specifies the name of the component and its version, respectively. Each value under this key must be a string value.

The application version information may be read by a number of off-the-shelf SNMP based network management packages in addition to the MK2000's Configuration Utility (Refer to Software Version Information under *Remote Monitoring* on page 3-4 for details).

For an example .reg file see the demo application's "ResidentDemo.reg" file. The file contains the following text on two lines:

```
[HKEY_LOCAL_MACHINE\Software\AppVersions]
```

```
"ResidentDemo"="2.0"
```

When an MK2000 that contains the ResidentDemo.reg file in its Application folder at bootup is queried by the Configuration Utility for application version information, it will return the following: ResidentDemo 2.0. The applications name is ResidentDemo and its application version is 2.0.

Actions - Custom MIB

The following Actions / Commands are supported by the MK Custom MIB:

Table 6-4. Custom MIB Actions/Commands

Action/Value	Var Name	OID	Access	Data Type
Cold Reboot	Performs an immediate cold boot of the MK2000.			
	stiColdBoot	SysOID.10.1	WO	
Warm Reboot	Performs an immediate warm boot of the MK2000.			
	stiWarmBoot	SysOID.10.2	WO	
Launch AirBeam	Launches AirBeam with no command-line parameters, causing it to perform whatever function is stored in its registry settings. There is no mechanism to provide command-line arguments to AirBeam via SNMP			
	stiLaunchAirBeam	SysOID.10.3	WO	
GUID	Returns the globally unique system identifier (GUID/UUID). This can be used for reliable product tracking as this number will not change if the operating system or other portion of system software is changed.			
	stiSystemGUID	SysOID.10.4	RO	String (DisplayString)

Accessing the Windows® CE Desktop

If an MK2000 has been configured to automatically launch an application via its `mkconfig.reg` file on power-up, this setting must be bypassed when the system is booted to gain access to the Windows® CE desktop.

Gaining Access to the Windows CE Desktop

1. To perform a cold boot press and hold buttons **B** and **C** until the display goes blank (typically 15 seconds) then release buttons, see Figure 1-1 on page 1-3. The MK2000 reboots.
2. To prevent the MK2000 from entering an application, simultaneously hold down buttons **A** and **D** just after the blue *Performing System Initialization (Phase 1)* screen appears. The **A** and **D** buttons must be held down before the message changes to *Phase 2*.
3. When the Enter Password prompt appears, enter **DDBAC** and touch OK on the screen, or simultaneously press the **A** and **B** buttons for Enter.
4. The MK2000 enters Protected Mode and the Windows® CE desktop appears.



Password Protection (Gate Keeper)

The Gate Keeper provides the password protection to access the Windows® CE desktop. After Windows® CE boots, but before any application is run, the Gatekeeper checks (for two seconds) to see if the user has selected the appropriate combination of buttons (currently **A** and **D**) just after the blue *Performing System Initialization (Phase 1)* screen appears to request password entry. If the combination is detected, a dialog box is launched for the user to enter a password. The buttons are mapped to produce the characters 1, 2, 3, 4, Enter and Escape, as listed in Table 6-5. Enter the desired character sequence and press **Enter** to submit the password, or **Cancel** to abort the attempt. If the password is submitted and correct, the Gate Keeper provides access to the Windows® desktop. If the password is incorrect, or Protected Mode access was not requested, the MK2000 enters the configured mode (the default is the MK2000 Demo Application).

Password Protection can be set up via the Configuration Utility's Protected Mode feature (*System Configuration/Protected Mode*). See page 3-29.

Table 6-5. Button Mappings for Protected Mode

Button Combo	Character / Action	Note
A and D	Request Protected Mode	Only for 2 seconds after boot
A	'1'	During password entry
B	'2'	During password entry
C	'3'	During password entry
D	'4'	During password entry
A and B	'Enter' (Return)	During password entry
C and D	'Escape' (Cancel)	During password entry

Remapping Buttons

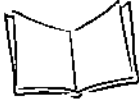
The four buttons on the front of the MK2000 can be used individually, or in combinations. All 15 combinations can be remapped to a virtual keycode that represents a given character or key sequence, as defined in the table at the end of this section. Any combination that includes buttons **B** and **C** will cause a cold boot if held for more that 15 seconds. Use the Control Panel - Button Definitions, the System Menu, or Configuration Utility to remap the buttons (refer to Table 6-7 on page 6-8).

Table 6-6. Default Button Mapping

Button Combo	Mapping	Hex Code
A	Up	0x26
B	Down	0x28
C	Left	0x25
D	Right	0x27
AB	Enter/Return	0x0D
AC	Shift-Tab	0xC3
AD	Alt	0x12
ABC	System Menu	0xC5
ABD	Alt-Down	0xC2
ACD	Calibration	0xC4
BC	Unmapped	
BCD	Backspace	0x08
BD	Tab	0x09
CD	Cancel/Escape	0x1B
ABCD	Signal Strength	0xC6

Note 1: To disable a button combination, set its mapping to 0.

Note 2: To perform a cold boot press and hold buttons **B** and **C** until the display goes blank (typically 15 seconds) then release the buttons, see Figure 1-1 on page 1-3. The MK2000 reboots.



Button Remapping - Keycode Values

Table 6-7 shows the keycode values to use when remapping buttons.

Table 6-7. Keycode Values

Button Values			
Function	Value	Function	Value
BACK	0x08	COMMA	0xBC
TAB	0x09	HYPHEN	0xBD
CLEAR	0x0C	PERIOD	0xBE
RETURN	0x0D	SLASH	0xBF
SHIFT	0x10	BACKQUOTE	0xC0
CONTROL	0x11	F1	0x70
ALT	0x12	F2	0x71
CAPITAL	0x14	F3	0x72
ESCAPE	0x1B	F4	0x73
SPACE	0x20	F5	0x74
PRIOR	0x21	F6	0x75
NEXT	0x22	F7	0x76
END	0x23	F8	0x77
HOME	0x24	F9	0x78
LEFT	0x25	F10	0x79
UP	0x26	F11	0x7A
RIGHT	0x27	F12	0x7B
DOWN	0x28	0 thru 9 are the same as ASCII '0' thru '9'	0x30 – 0x39
MULTIPLY	0x6A	A thru Z are the same as ASCII 'A' thru 'Z'	0x41 - 0x5A
ADD	0x6B	SHIFT-TAB	0xC2
SEPARATOR	0x6C	ALT-DOWN	0xC3
SUBTRACT	0x6D	CALIBRATION	0xC4
DECIMAL	0x6E	SYSTEM MENU	0xC5
DIVIDE	0x6F	SIGNAL STRENGTH	0xC6
SEMICOLON	0xBA	TOGGLE SOFTWARE INPUT PANEL (SIP)	0xC7
EQUAL	0xBB	COMMA	0xBC
HYPHEN	0xBD		

Network Time Update: SNTP Client

The MK2000 is shipped with a Simple Network Time Protocol (SNTP) client that can be used to automatically set and update the MK2000's time and date via the network. This feature is used to restore the system time and date across reboots or power outages.

In addition, the automated update of the system time and date also ensures consistent time and date stamping across a fleet of MK2000s. The SNTPClient program sets the MK2000's time and date by querying one or more SNTP servers over the network.

The SNTP client has four registry parameters, which can be set up via the Configuration Utility's Network Time Update feature (*System Configuration/Network Time Update*). See page 3-28.

- **Server(s)**

A multi string value specifying the SNTP servers to be queried. The servers will be queried in order until one is successful or the list is exhausted. If the MK2000 is unable to obtain a time value from a server it will use the default setting (June 1, 1999 12:00:00 AM). An attempt to acquire a time value will not be made again unless a regular update is also configured, and the attempt will be made at the configured time.

The value can be specified as a DNS name or an IP address.

If this value is not set, or set to a NULL string (""), the SNTP client is disabled.

- **Quiet Mode**

A flag that instructs the program to report its results and/or problems (via message boxes) or to not report results and/or problems. A zero value is used for "report", any other value means "don't report". This is generally set to non-zero to disable reporting so user's do not see system messages. Setting this to zero is generally used for trouble-shooting.

- **Update Period**

A number indicating the interval in minutes between executions of the program. A value of zero means the program is not scheduled to run periodically. A non-zero value means the program will run again in "Update Period" minutes. Updating the time once a day is generally sufficient to ensure consistently accurate time reporting.



- **Retry Period**

The number of seconds for which the update utility will query the time servers. This can be used as a delay to allow the network to be configured at boot time

Default values are:

Server(s) = "" (i.e., a null string which means "disabled")

Quiet Mode = 1

Update Period = 0

Retry Period = 25 seconds

The program also accepts the following command line parameters, all of which override the registry values:

hosts

A comma separated list of SNTP servers to be queried. The servers will be queried in order until one is successful.

/Q

Don't report any results and/or problems (quiet).

/N

Report all results and/or problems (noisy).

/P

Run the program periodically according to the period value in the registry.

The SNTPClient program is run as part of the MK2000's StartUp sequence, before any user programs are run, with the following command line:

`SNTPClient /Q /P`

This means that it will use the Hosts registry entry if one is available, not report any results and/or errors, and will schedule itself to run periodically if there's a non-zero Period value in the registry. Therefore, the default parameters effectively cause the program to be disabled.

FTP Server

The FTP server is implemented based on RFC 959, which defines the FTP requirements. FTP server supports the minimum implementation of the FTP server defined in RFC 959. This minimum implementation includes configuration values, transfer parameters and supports only ASCII and image data types.

Note: *Partitions cannot be updated using FTP.*

This server has had minimal security auditing and is intended as an aid for development only. Production use of this server is not warranted and under no circumstances should it be enabled in anonymous mode if the MK2000 is accessible from the internet.

The FTP server is enabled by default when shipped.

The FTP server can be set up via the Configuration Utility's FTP Server feature (*Update/FTP Server*). See page 3-39.

FTP Server Registry Parameters

Allow Anonymous

There is no authentication of users so users do not need to have an account on the local machine. Allows copying of data from MK2000.

Allow Anonymous Upload

Allows anonymous users to copy data to the MK2000.

Root Directory

Root directory. Only this directory and subdirectories are accessible remotely. Defaults to "\".

Is Enabled

Causes the server to be automatically launched at boot time.

Use Authentication

Determines whether authorization is required to connect to the server. If set, a valid user account on the local machine is required and the correct id and password for the account must be specified to the server.



User List

If Use Authentication is set, specifies the list of users that are allowed to login to the server. These accounts must already exist in order for the user to be permitted access.

Inactivity Application (Screen Saver)

The Inactivity Application Manager (IAM) is the screen saver engine for the MK2000. It is responsible for launching and terminating the screen saver at appropriate times but does not provide the actual screen saver images. The screen saver application is termed here an "Inactivity Application".

Users can use one of the provided applications described below, or can create their own application. The IAM can be configured via the Configuration Utility's Inactivity Manager feature (*System Configuration-Inactivity Manager*). See page 3-28.

The screen saver exits if any of the following events occur:

- barcode scan
- pen tap
- button press
- MSR activity

Note that the barcode scan data and MSR data are passed through to the application behind the screen saver.

SimpleSaver

The SimpleSaver program is a very simple screen saver application. It clears the screen to white and repeatedly displays this message at different locations on the screen:

Perform some action to wake me up!

This program is used as the default IAM (Inactivity Application Manager) application.

This Inactivity Application is designed to provide a simple example of how to implement a custom application, it is not intended to be used as a final presentation tool. Source code is provided in the SDK (part number MK2000CESDK-x.xx).

SlideShow

The SlideShow program is a screen saver program that endlessly displays a group of graphics files (slides) one at a time. The program is capable of displaying graphics files with the following extensions:

- JPG
- GIF
- BMP
- 2BP.

The program uses the following registry entries under the [HKEY_LOCAL_MACHINE\Software\Symbol\SlideShow] key:

- **Directory**
A string value specifying the graphics files location directory.
- **Delay**
A DWORD value indicating the number of seconds to display each graphic for. If not specified, the default delay is 5 seconds.
- **Background**
A DWORD value specifying the background color to use around graphics that are smaller than the screen size. If not specified, the default background is 0x700000 (a middle range blue).

These values can be set using the Configuration Utility.

The program does not accept any command line parameters.

Once the program has read the registry entries, it tries to read a file named *SlideShow.txt* from the graphics directory. If this file exists, it should contain one file name per line. These file names should not include a path and they must exist within the graphics directory. The files will be displayed in the order specified.

If the *SlideShow.txt* file is not present, the program will scan the graphics directory for all files with the appropriate file name extensions. These files will be displayed in a sequence that is determined by the file system.

If a slide is smaller than the screen size, it will be centered on the screen and the background color will be drawn in the area around the slide. If a slide is larger than the



screen size, it will be scaled to fit on the screen. This scaling can result in a strange effect if the slide is not proportional to the screen size. For best results, use slides that are the same size as the screen. Source code is provided in the SDK (part number MK2000CESDK-x.xx).

Browser Applications - Hiding Toolbars

The MK2000 is shipped running the standard browser (iesample.exe), which leaves the Windows[®] CE start bar and the Internet Explorer toolbar visible and accessible. To run a browser application with no toolbars (Windows CE[®] start bar and Internet Explorer toolbar), use kioskie.exe. To start the browser application using kioskie.exe without toolbars, use the Configuration Utility. Within the Configuration Utility, configure the "first application launched" for kioskie.exe. The path to the "first application launched" is: system configuration/user app(s)/First application launched/application path. Enter \\windows\\kioskie.exe in the "application path" field.

For sample source code that demonstrates hiding browser toolbars and the Windows[®] CE start bar from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.

Browser Applications - Handling Network Disconnects

One method of handling a web page that does not load properly due to a lost network connection is to load a local page on the MK2000 that acts as the home page. This page has two frames:

- Test frame - periodically tests for proper loading of the other frame.
- Main frame - contains the application.

The second frame refreshes every few seconds. If the host is unavailable, a local error message is displayed in the application frame. When the host is available again, the home page is put in the main frame again.

Sample source code for implementing this is provided below:

Main

```
<html>
<head>
  <title>Untitled</title>
  <meta http-equiv="refresh" content="10";URL=main.html">
</head>
<!-- frames -->
```

```
<frameset rows="5,*">
  <frame name="top_frame" src="test.html" marginwidth="1" marginheight="1"
scrolling="no" frameborder="NO">
  <frame name="price_frame" src="http://235.235.35.235/postinfo.html"
marginwidth="1" marginheight="1" scrolling="no" frameborder="no">
</frameset>

</html>
```

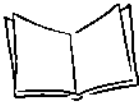
Test

```
<html>
<head>
<script language=VBScript>
sub showErrorTry()
    parent.price_frame.location.href="retry.htm"
    end sub
sub showError()
    If parent.price_frame.location.href ="res://shdocvw.dll/dnserror.htm#http://
235.235.35.235/postinfo.html" Then
        showErrorTry()
    End If
end sub
</script>
</head>

<body onload="timer=setTimeout('showError()',900)">
</Body>
</body>
</html>
```

Retry

```
<HTML>
<BR>
<BR>
<BR>
<BR>
<BR>
```





 Server Down ..Please try later....

</HTML>

Input Panel

An input panel (virtual keyboard) on the touchscreen of the MK2000 is used to enter information. (Refer to Figure 6-1 on page 6-16.)

To access the *Input Panel* for entering text, tap the  icon located on the icon tray. The *Input Panel* screen is displayed (see Figure 6-1). The icon can be used to enter information when required by any application on the MK2000. A stylus is used to select the keystrokes on the input panel. To close the *Input Panel*, double-tap the  icon.

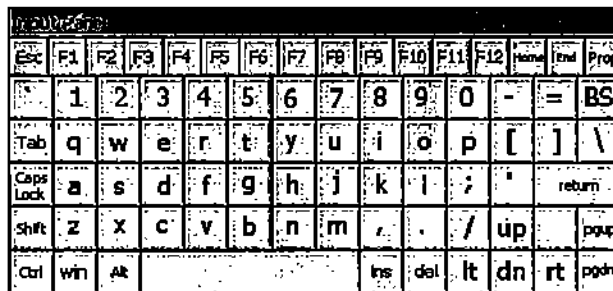


Figure 6-1. Input Panel (Virtual Keyboard)

Note: **Ctrl-C** can be used to copy text, and **Ctrl-V** can be used to paste text.

Microsoft WordPad

Microsoft *WordPad* is an application that allows creating, editing and viewing documents on the MK2000. If desired, a document can be password-protected.

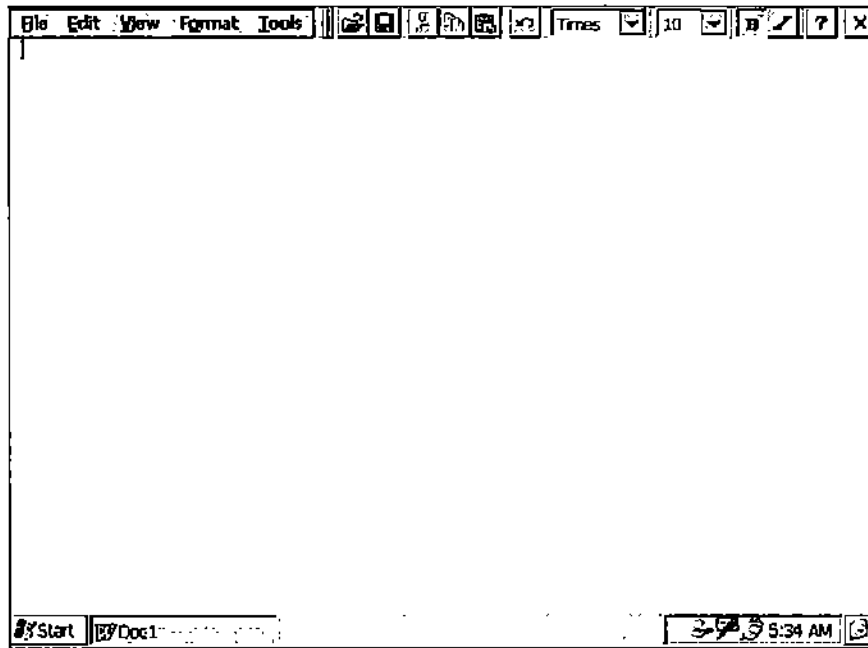


Figure 6-2. Using WordPad



A file on the MK2000 can be opened, but it must be in a format that *WordPad* can read (or convert). *WordPad* can explore the MK2000 to find files stored on the device. Select a file in the list and tap **OK** to open it.

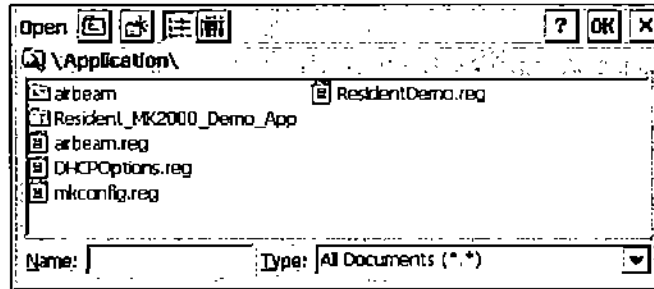


Figure 6-3. Open File Dialog Box

Information can be entered in *WordPad* as with any text editing program. Font type, style, color and size can be selected.

Use the input panel to enter typed text into a document. Refer to *Input Panel* on page 6-16.

To format or edit text, select the text using a stylus to drag across the text. To search a document for the specific text, tap *Edit/Find*.

To change the zoom magnification, tap *View - Zoom*. Select the percentage. Select a higher percentage to enter text and a lower one to see more of the document.

If a document created on a host computer is being opened, tap *View - Wrap to Window* to see the entire document.

Windows Media Player

With Windows® *Media Player* on the MK2000 digital audio and video files can be played. To launch to Windows Media Player, tap *Start/Windows Media*, or double-tap the *Media Player* icon on the MK2000 desktop.

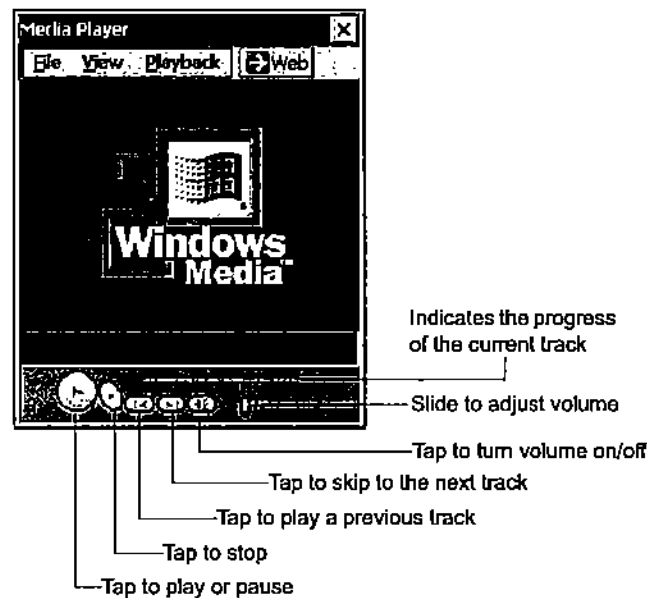


Figure 6-4. Using Windows Media Player

Use the host computer to copy digital audio and video files to the MK2000. The MK2000 can play WMA, MP3, WAV, GIF, WMV and MPEG4 files.

The appearance of the *Media Player* can be customized using the MK2000's SDK.

For more information on using *Media Player*, tap the **Web** button. This opens the Windows Media web site.

For sample source code that demonstrates using *Media Player* from a browser application, refer to the Resident Application's *readme.txt* file, which is part of the Resident Demo Application.



Internet Explorer

With Microsoft Internet Explorer (5.5 compliant), Web pages can be viewed on the MK2000. The appearance of the Internet Explorer can be customized using the MK2000's SDK.

To select Internet Explorer, tap *Start-Internet Explorer* or double-tap the *Internet Explorer* icon on the MK2000 desktop. The internet browser window opens (see Figure 6-5).

Browsing the Web

Go to a specific Web page in one of the following ways:

- Tap *Favorites*, then tap the favorite you want to view. Note that new favorites added are not persisted as part of Internet Explorer's settings.
- In the address bar at the top of the screen, enter the Web address using the input panel and tap the **Enter** button, or tap the arrow to choose from previously entered addresses.

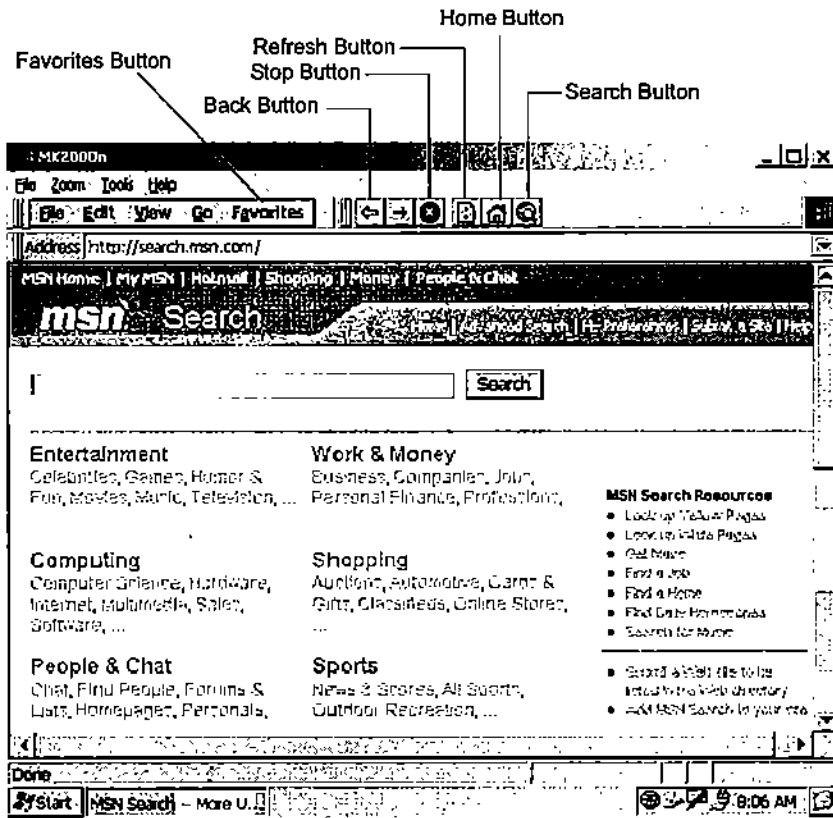
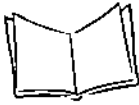


Figure 6-5. Internet Explorer



Printer Debugging

The *Printer Object Test Page* (see Figure 6-6) can be used for debugging serial printer connections and to print test barcodes, bitmaps and text. The *Printer Object Test Page* is accessed from a drop-down menu within Internet Explorer (*Start-Internet Explorer-Favorites-Printer Object Test Page*). A list of all MK2000 supported printers is available from the *Printer Language* drop-down menu, which includes the following information for each printer:

- Programming Language acronym (for example, CPL)
- Printer Company (for example, Zebra)
- Supported Printers (for example, QL320, Cameo, Encore3).

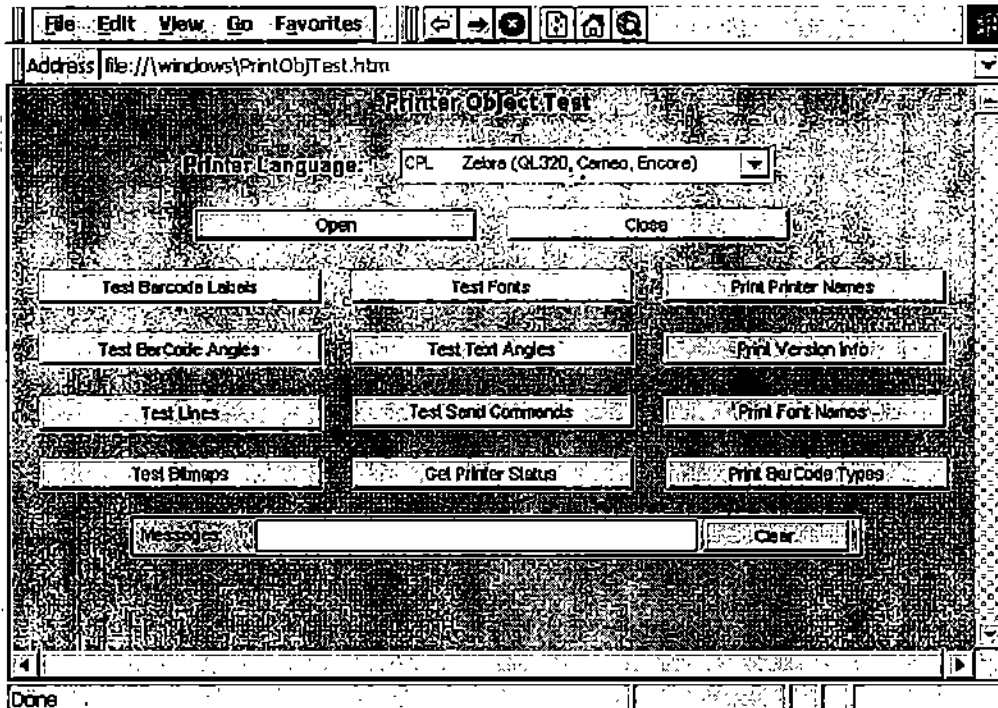


Figure 6-6. Printer Object Test Page

MSR Object Test

The *MSR Object Test Page* (see Figure 6-7) can be used for testing the MSR from a browser. The *MSR Object Test Page* is accessed from a drop-down menu within Internet Explorer (*Start-Internet Explorer-Favorites-MSR Object Test Page*).

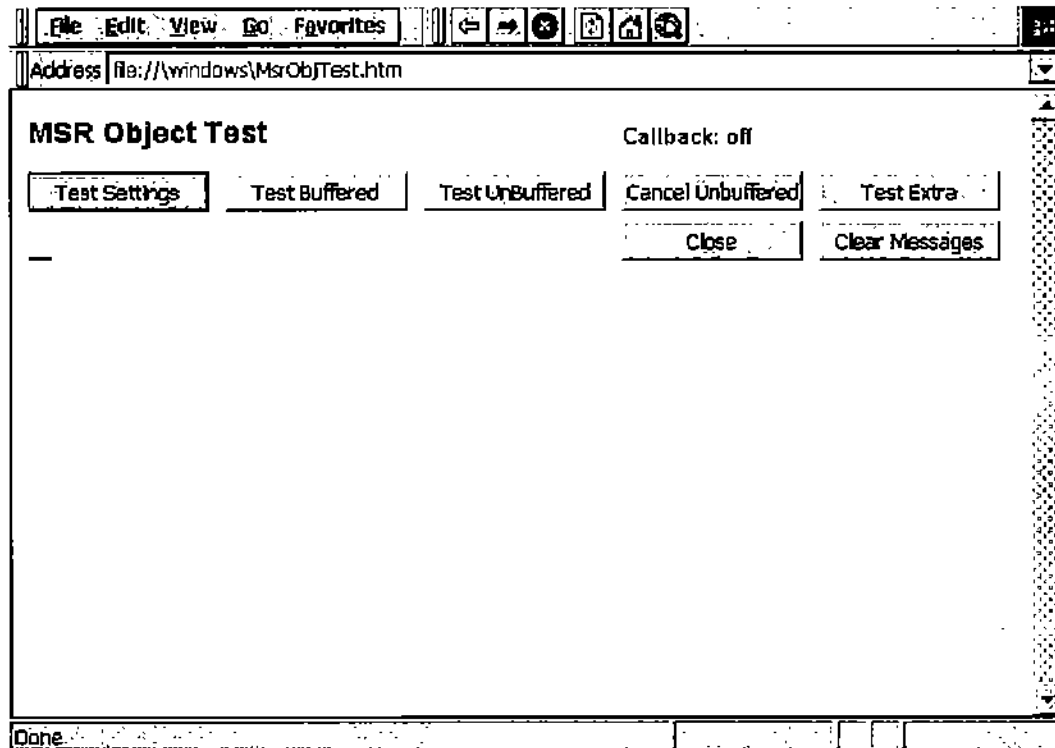
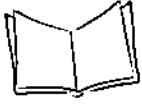
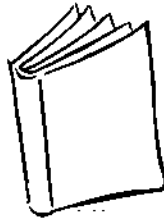


Figure 6-7. MSR Object Test Page



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Chapter 7

Software Development Environments

Overview

The MK2000's operating system is WinCE .NET 4.1. The MK2000 allows several choices for software development environments. The operating system contains support for the major technologies and functions needed to develop an application in any of the following environments:

- Windows[®] CE applications
 - Unmanaged applications
 - C and C++
 - Managed applications
 - C#
 - Visual Basic.NET
- Thin Client
 - Browser application (vbscript or jscript)
 - Windows[®] applications via Terminal Server Client (RDP)
- PCK Emulation
- IBM 4690 applications via StoreWave.

Software Developer Kit (SDK)

Two software developer kits exist for the MK2000. The conventional SDK covers unmanaged (C and C++) and thin client (browser and RDP) applications, and the SMDK for .NET covers managed (C# and VB.NET) applications.



Conventional SDK

The conventional SDK is based upon industry standard Microsoft® Windows® CE development tools and enables development of unmanaged (C and C++) and thin client (browser and RDP) applications.

The conventional SDK includes standard Symbol C APIs, plus MK2000 specific C APIs for use with Microsoft® Embedded Visual C++ 4.0 Service Pack 1* (eVC++ 4.0). The MK2000 also supports five ActiveX objects, such as the scan engine ActiveX object, for interacting with the MK2000 and its peripherals in a browser application. A fully functional web-based demo application with source code is available as a programming sample for the ActiveX objects, and each object has its own simple test page that demonstrates the use of each property/method of the object.

The conventional SDK and Resident Demo Application can be downloaded from <http://devzone.symbol.com/>.

Symbol Mobility Developer Kit (SMDK) for .NET

The Symbol Mobility Developer Kit (SMDK) for .NET allows Microsoft® .NET Compact Framework developers to create managed (C# and VisualBasic.NET) applications that harness Symbol value-add features on the MK2000.

The SMDK for .NET provides all of the tools including class libraries, sample applications, and associated documentation necessary to develop C# and VB.NET applications when used in conjunction with Microsoft Visual Studio .NET 2003.

The SMDK can be downloaded from <http://devzone.symbol.com/>

Windows® CE Applications

Windows® CE applications can be grouped into two categories, managed applications and Unmanaged Applications. The MK2000 supports both application types.

Unmanaged Applications

Unmanaged or native applications are standard compiled Windows® CE applications. Unmanaged C and C++ applications can be created using Microsoft® Embedded Visual C++ 4.0 Service Pack 1.

The Software Development Kit (SDK, part number MK2000CESDK-x.xx) includes standard Symbol C APIs and MK2000 specific APIs.

Managed Applications

The MK2000 supports managed applications using Microsoft® .NET Compact Framework, which is a subset of Microsoft® desktop .NET Framework.

Development of managed C# and VisualBasic.NET (VB.NET) applications on Symbol products can be achieved using Symbol Technologies' .NET SDK, called the Symbol Mobility Developer Kit (SMDK) for .NET in conjunction with Microsoft® Visual Studio .NET 2003.

Browser Applications

Browser applications can be developed for the MK2000. The browser provided with the MK2000 is Internet Explorer CE version 5.5, which supports VBScript and Jscript. (See <http://www.microsoft.com> for detailed information on Internet Explorer CE version 5.5 features and limitations.)

The MK2000's also includes the kiosk browser. This browser can be configured with its tool bar and the Window's Start bar hidden, not accessible from the screen. For details on the kiosk browser, refer to *Browser Applications - Hiding Toolbars* on page 6-14. This enables the developer to have full control over the application and prevent a user from accessing the CE desktop.

Control over the scan engine (and external scanner), four programmable buttons, microphone, MSR and printers is provided via ActiveX objects.

Windows® Applications via Terminal Server Client (RDP)

The MK2000 supports Remote Desktop Protocol (RDP) technology, which allows a thin client, such as the Terminal Server Client, to communicate with Microsoft's® Terminal Server across a LAN or WLAN.

PCK Emulation (Support for MK1000 Legacy Applications)

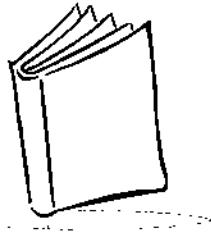
A version of Symbol's PCK terminal emulation program is available for the MK2000 (download from Symbol Developer zone, <http://devzone.symbol.com/>). This program is backwards compatible with the MK1000's PCK emulation.

IBM 4690 Applications

The MK2000 will communicate with IBM 4690 systems via Symbols Storewave 4690 software. To communicate with Storewave, the MK2000 must be running PCK emulation. Many 3rd party IBM 4690 solutions are also available.



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Appendix A Technical Specifications

Technical Specifications

Table A-1. MK2000 Technical Specifications

MK2000 Technical Specifications	
Dimensions	10.9 in. H x 8.9 in. W x 3.6 in. D 27.7 cm H x 22.6 cm W x 9.1 cm D
Weight	3.4 lbs / 1.55 kg (typical)
Power	12-24 VDC 24 Watts
	Supports Symbol Proprietary Power-over-Ethernet
Data Ports	RS-232: Powered (5V / 500 mA), RJ-45 Connector
	RS-485: RJ-45 Connector
	Ethernet: 10/100 Mb 10Base-T, 100Base-TX, RJ-45 connector
Audio Ports	Speaker: Two, integrated stereo speakers
	Headphone Jack: Standard 3.5 mm jack
	Stereo Line Out: 2.2 watts per channel, 3.5 mm jacks
	Microphone: Located under left side of display
Buttons	4 Programmable Buttons



Table A-1. MK2000 Technical Specifications (Continued)

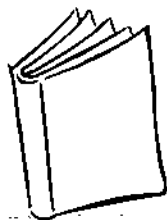
MK2000 Technical Specifications	
Expansion Capabilities	One Type II/III PC Card
	One Type I/II CompactFlash™ Card
Display	
Size	Size 6.4 inches (16.26 cm) diagonal
Resolution	640 x 480 pixels (Full VGA) active matrix
Resistive Touch Screen	Standard
Scanner	
Scan Modes	1D: Omni-directional scanning 2D: Smart raster
Light Source	650 nm laser diode
Decode Capability	
1D Symbologies	All standard retail codes including: UPC/EAN, Code 39, Interleaved 2 of 5, Code 128, Codabar, MSI Plessey
2D Symbologies	PDF417, MicroPDF
Processor	Intel XScale™ (400 MHz)
Flash Memory	64 MB
RAM	32 MB DRAM
Software	Operating Platform: Windows® CE .NET 4.1
Browser	Internet Explorer CE version 5.5
Audio/Video via Windows® CE Media Player	Audio: WMA and MP3 Images: GIF, JPEG and BMP Video: WMV and MPEG
Available Applications	Demo Application with source code PCK9100 Emulation IBM 4690 Emulation AirBeam® Smart Built-in FTP Server Built-in SNTP Client

Table A-1. MK2000 Technical Specifications (Continued)

MK2000 Technical Specifications	
Application Development Tools	<p>MK2000 SDK includes C APIs and Active X Objects and supports attachment of Serial Printer and MSR.</p> <p>SDK provides support for application development using eVC++ 4.0 SP1.*</p> <p>Configuration Utility</p> <p>SMDK for .NET available for C# and Visual Basic.NET application development</p> <p>Software tools listed above are available from Symbol Developer Zone Web site, http://devzone.symbol.com/</p>
Communications	Serial: RS-232 and RS-485
	Ethernet: 10/100 Mbps Ethernet (802.3)
	WLAN: 11 Mbps (802.11b) and 2 Mbps (802.11)
Operating Temperature	32° F to 104° F (0° C to 40° C)
Storage Temperature	-13° F to 158° F (-25° C to 70° C)
Humidity	5% to 80% (non-condensing)
Electrical Safety	Certified to UL60950/CSA C22.2 No. 60950, EN60950/IEC950
EMI/RFI	FCC Part 15 Class B, ICES-003 Class B, European Union EMC Directive, Australian SMA
Laser Safety	CDRH Class II, IEC Class 2
Mounting Options	Conforms to VESA 100mm mounting standard for third-party, off-the-shelf mounting solutions
	Wall Mount Bracket
	Pole Mount Bracket
Optional Accessories	3-track Magnetic Stripe Reader
	Signage (advertising/placard) Mounting Kit



MK2000 MicroKiosk Product Reference Guide









Appendix B

Spectrum24 Network Configuration

Introduction

The MK2000 supports wireless communication via Spectrum24 wireless LAN connection. This requires Access Points (APs) to be properly configured within the facility. The MK2000 can then be configured for wireless communication. Refer to the documentation that came with the Access Points (APs) for instructions on setting up the wireless LAN hardware.

The *Mobile Companion* utility is used to configure the MK2000's wireless network settings. The *Mobile Companion* icon appears in the task tray (see Figure B-1 on page B-2), and indicates MK2000 signal strength as follows:

Icon	Status
	Excellent signal strength
	Very good signal strength
	Good signal strength
	Fair signal strength
	Poor signal strength
	Out-of-network range (not associated)



Mobile Companion (11 Mbps Radio)

The *Mobile Companion* utility can be configured to start automatically and appears as an icon on the task tray. The status icon changes in real-time to reflect the signal strength and availability of the adapter and the wireless network. Tap the icon on the task tray to open the *Mobile Companion* menu.

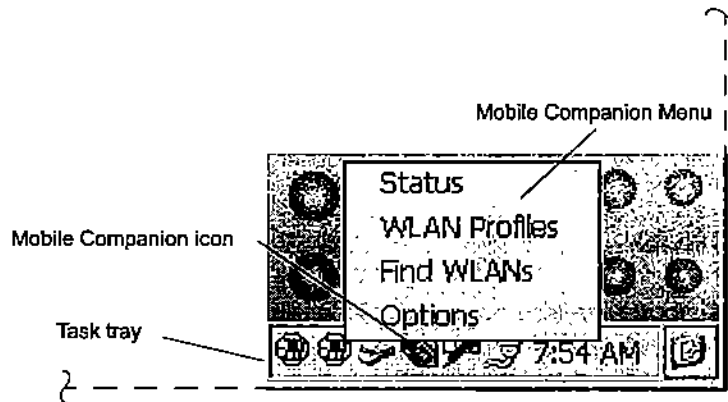


Figure B-1. Mobile Companion Menu

When the menu opens, select *Status*, *WLAN Profiles*, *Find WLANs* or *Options* from menu.

Table B-1. Mobile Companion Menu Descriptions

Menu Item	Description
Status	<p>Displays the current status and information for the wireless connection.</p> <p><i>Signal</i> tab view - displays radio signal transmission strength from the adapter (using its current profile) to the associated AP.</p> <p><i>Info</i> tab view - displays software, driver, firmware, hardware, and country information for the current profile.</p> <p><i>IP Status</i> tab view - displays network address information.</p> <p><i>Ping</i> tab view - displays signal strength data, data rate, and conduct data transmission tests between the MK2000 and associated AP or client.</p> <p><i>APs</i> tab view - displays APs with the same ESSID as the current MK2000 profile. The MK2000's roaming capabilities can be set from this tab.</p>

Table B-1. Mobile Companion Menu Descriptions (Continued)

Menu Item	Description
WLAN Profiles	<p>Lists the current profiles and allows the user to add, edit and delete profiles.</p> <p>Only the Default profile is maintained in <code>mkconfig.reg</code>. All configuration should be done with the Default profile only. Additional profiles should not be created, and will not be saved through a power cycle. Under Edit, the Mode, Encryption, IP Config and Power tab views show the ESSID, security settings, network address information and power consumption level for that profile. Refer to page B-5.</p>
Find WLANs	<p>Displays a list of Spectrum24 networks (APs and networked peers) available to the MK2000 for association. The networks are listed by their ESSID. Tap a network and tap Connect to interoperate with the AP representing that network. See <i>Using Find WLANs</i> on page B-6 for more information.</p>
Options	<p>Displays settings for configuring system sounds, AP and MK2000 association capabilities, profile roaming options, as well as the password protecting the Mobile Companion utility.</p>



Configuring Mobile Companion

Mobile Companion is automatically launched at power-up if an 11 Mbps Spectrum24 radio and driver are installed in the MK2000. After the Mobile Companion software starts, an icon will appear in the task tray. In the event that it doesn't automatically launch, you must manually launch Mobile Companion on the MK2000 by selecting *Start/Programs/Tools/S24 Event Monitor*.

Configuring the Default Profile

1. Tap on the task tray icon and select *WLAN Profiles* from the *Mobile Companion* menu. When the *WLAN Profiles* window initially displays, two profiles appear in the *WLAN Profiles* list box. See Figure B-2.

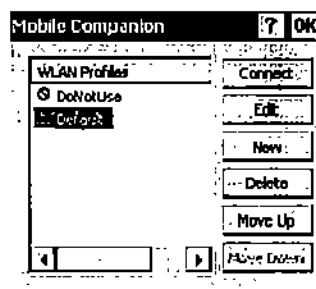
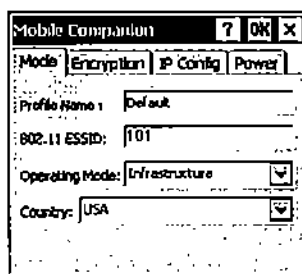


Figure B-2. WLAN Profiles

2. Select **Default** from the list box. Tap **Connect** to set **Default** as the active profile. The **Default** profile displays the transmit and receive icon to the left.

3. Select **Default** from the list box and tap **Edit** to display the *Mode* tab, where the ESSID and operating mode can be changed for the **Default** profile. Use the *Encryption* tab (Figure B-5 on page B-8), *IP Config* tab (Figure B-6 on page B-10 and Figure B-7 on page B-10), and *Power* tab (Figure B-8 on page B-12) as necessary to edit the profile power consumption and security parameters.



Infrastructure Mode

Figure B-3. Mode Tab

4. Set the operating mode from the *Operating Mode* drop-down list. Choose *Infrastructure* to enable the MK2000 to transmit and receive data with an AP. *Infrastructure* is the MK2000 default mode when Mobile Companion initially launches.

Select the country of operation for the MK2000 from the *Country*: drop-down list. This ensures the MK2000 is using country code information compatible with the country code data used by the associated AP. Select *International* if using the MK2000 with a non-Symbol AP or a pre AP-4131 model.

Note: *Country code is not persisted across power-down and power up cycles.*

5. Save the Mobile Companion settings to ensure that they persist between power-down and power-up cycles. To save the settings, tap *Start-Programs-Save Configuration*.

Note: Not all parameters are saved - refer to Table 3-4 on page 3-19.



Using Find WLANs

Find WLANs can be used to list the ESSIDs of active wireless LANs operating in the vicinity of the MK2000. See Figure B-4.

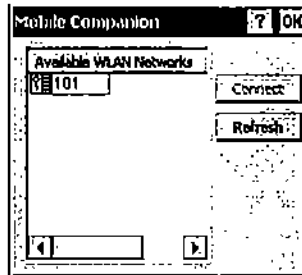


Figure B-4. Available WLAN Networks

If you select a listed WLAN ESSID and tap **Connect**, the *Mode* tab appears. The Profile Name: and 802.11 ESSID: fields are pre-populated with the ESSID selected from the list. This profile is not saved in `mkconfig.reg`, and will be lost if the MK2000 is power cycled.

Encryption

The MK2000 supports a number of wireless security encryption algorithms:

- Open System (no encryption)
- 40-bit Shared Key
- 128-bit Shared Key
- Keyguard
- Kerberos
- LEAP.

Note: *Encryption keys are entered via Mobile Companion. When saved by selecting Start/Programs/Save Configuration from the MK2000 desktop, the encryption keys entered are saved in the MK2000's mkconfig.reg file and will persist across power-down and power-up cycles. If the encryption keys are not saved via "Save Configuration", the settings will be lost at the next power-down. Note that the encryption keys are hidden and cannot be edited in the Configuration Utility and System Menu. If a new mkconfig.reg file is created and distributed to a customer, any RF encryption keys will need to be re-entered locally at each MK2000.*

The absence of a physical connection makes wireless links vulnerable to information theft. Encryption is an efficient method of preventing data theft and improving data security.

The Access Point (AP) and the MK2000 are required to use the same encryption algorithm to associate and transmit data. If an AP is set to Open System and an adapter is set to 40-bit or 128-bit, no association takes place. Similarly, if an adapter is set to Open System and an AP is set to 40-bit or 128-bit, no association takes place.

If an AP is set to 40-bit and the MK2000 is set to 128-bit, the MK2000 can associate with the AP, but no data transmission and reception can take place.

Kerberos is a different form of 128-bit data security whereby an MK2000 is required to have its request for AP resources authenticated with a Kerberos server before the server permits the AP to transmit and receive data with the associated MK2000.

LEAP (Lightweight Extensible Authentication Protocol) is an 802.1X authentication type for wireless LANs that supports strong mutual authentication between the client and a RADIUS server. It provides dynamic per-user, per-session Wired Equivalent Privacy (WEP) key enhancements to mitigate a variety of network attacks.



1. Tap the *Encryption* tab to set the MK2000 profile security level.

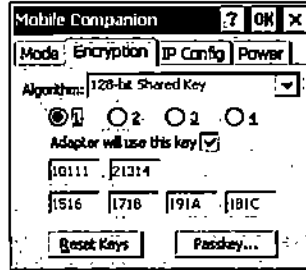


Figure B-5. Encryption Tab

2. Select one of the following *Encryption* options from the *Algorithm:* drop-down list:

- | | |
|--------------------------------|---|
| Open System
(no encryption) | Use the <i>Open System</i> option as the default setting when no data packet encryption is needed over the network. Selecting <i>Open System</i> provides no security for the data being transmitted over the network. |
| 40-bit Shared Key | Select <i>40-bit encryption</i> and enter a 10-digit hex encryption key. Tap Reset Keys to set the encryption key to the default values. |
| 128-bit Shared Key | Select <i>128-bit encryption</i> and enter a 26-digit hex encryption key. The <i>128-bit encryption</i> option provides a higher level of security than <i>40-bit encryption</i> while maintaining an 11 Mbps data rate. Tap Reset Keys to set the encryption key to the default values. |

Note: The default Hex digit keys are visible while they are being entered initially. As a security precaution after setting the key values for the network, the digits are replaced with asterisks * within the encryption key fields.

If the associated AP is using an optional **Passkey**, the "active" MK2000 profile is required to use one as well. The **Passkey** is a plain text representation of the WEP keys displayed in the *Encryption* tab. The **Passkey** provides an easy way to enter WEP key data without having to remember the entire 40-bit (10 character) or 128-bit (26 character) Hex digit string.

Tap **Passkey** to display the *Passkey* window. Enter an easy-to-remember 4 to 26 character string to be used as the WEP algorithm. Tap **OK**. The AP transforms the Passkey string into a set of four WEP keys using MD5 algorithms and displays them in the *WEP* fields. These are the new WEP keys for the MK2000 profile. Once displayed in the WEP key fields, the adapter profile behaves as if the keys were entered manually.

Note: To retain these key settings, you must save them by selecting *Start-Programs-Save Configuration* from the MK2000 desktop. The encryption keys entered will persist across power-down and power-up cycles. If the encryption keys are not saved in this manner, the settings will be lost upon the next power-down and power-up cycle

Kerberos

Kerberos is a different form of 128-bit data security whereby an MK2000 is required to have its request for AP resources authenticated with a Kerberos server before the server permits the AP to transmit and receive data with the associated MK2000.

Select *Kerberos* and enter the key distribution center (*KDC*) and *Realm* values. The KDC is located on a server and maintains information about the APs and users it supports. The KDC also permits the transmission and receipt of data once the credentials of the user are verified. Enter the name of the server that hosts the Kerberos KDC in the *Realm* field.

LEAP

LEAP (Lightweight Extensible Authentication Protocol) is an 802.1X authentication type for wireless LANs that supports strong mutual authentication between the client and a RADIUS server. It provides dynamic per-user, per-session Wired Equivalent Privacy (WEP) key enhancements to mitigate a variety of network attacks.

Select *LEAP*. When an attempt is made to connect to the server, the *Network Log On* screen displays. Enter the user name, password and domain name. Consult your system administrator for this information.



3. Tap the *IP Config* tab to configure the following MK2000 profile network address parameters: IP address, subnet, gateway, DNS and WINS. Changes made within the *IP Config* tab only impact the profile selected in the *Mode* tab and do not impact the network address parameters configured for other profiles.

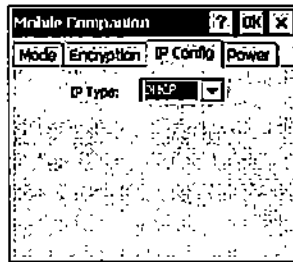


Figure B-6. Mobile Companion - IP Config Tab (DHCP)

- Select *Dynamic Host Configuration Protocol (DHCP)* from the *IP Type* drop-down list to obtain a leased IP address and network configuration information from a DHCP server. DHCP is the default setting for the MK2000 profile. When DHCP is selected, the IP address fields are read-only.
- Select *Static* to manually assign the IP, subnet mask, default gateway, DNS and WINS addresses used by the MK2000 profile.

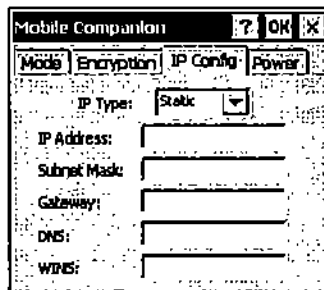
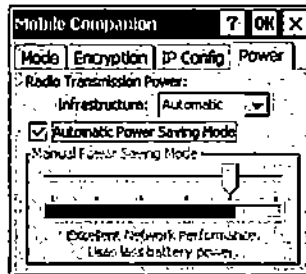


Figure B-7. Mobile Companion - IP Config Tab (Static)

IP Address	The Internet is a collection of networks with users that communicate with each other. Each communication carries the address of the source and destination networks and the particular machine within the network associated with the user or host computer at each end. This address is called the <i>IP Address</i> (Internet Protocol address). Each node on the IP network must be assigned a unique IP address that is made up of a network identifier and a host identifier. Enter the IP address as a dotted-decimal notation with the decimal value of each octet separated by a period, for example, 192.168.7.27.
Subnet Mask	Most TCP/IP networks use subnets in order to effectively manage routed IP addresses. Having an organization's network divided into subnets allows it to be connected to the Internet with a single shared network address, for example, 255.255.255.0.
Gateway	The default gateway is a device that is used to forward IP packets to and from a remote destination.
DNS	The <i>Domain Name System</i> (DNS) is a distributed Internet directory service. DNS is used mostly to translate domain names and IP addresses. It is also used to control Internet email delivery. Most Internet service requires DNS to operate properly. For example, if DNS is not configured, Web sites cannot be located and/or email delivery fails.
WINS	<i>WINS</i> is a Microsoft® Net BIOS name server. WINS eliminates the broadcasts needed to resolve computer names to IP addresses by providing a cache or database of translations.



4. Tap the *Power* tab to set the *Radio Transmission Power* level and the *Power Saving Modes* for the MK2000 profile.



Infrastructure Mode

Figure B-8. Mobile Companion - Power Tab

Adjusting the *Radio Transmission Power* level enables expanding or confining the transmission area with respect to other wireless devices that could be operating nearby. Reducing a coverage area in high traffic areas improves transmission quality by reducing the number of noises in that coverage area.

- In Infrastructure mode there are two transmission power options:
 - Select *Automatic* to match the AP power level. *Automatic* is the default mode for MK2000s operating in Infrastructure mode.
 - Select *Power Plus* to set the MK2000 transmission power one level higher than the level set for the AP.
- Select *Maximum* power to set the MK2000 to the highest transmission power level. Select *Maximum* power when operating in highly reflective environments and areas where other devices could be operating nearby. Additionally, use the maximum power level when attempting to communicate with devices at the outer edge of a coverage area.
- Adjust the slider to select intermediate power levels.
- Select *Minimum* power to set the MK2000 to the lowest transmission power level. Use the minimum power level when communicating with other devices in very close proximity. Additionally, select minimum power in instances where little or no radio interference from other devices is anticipated.
- The *Automatic Power Saving Mode* switches to *Best Network Performance* when an AC power supply is detected. If a battery is used, an appropriate setting between *Best Network Performance* and *Acceptable Network Performance* is automatically chosen based on a real-time analysis of network usage. The

Automatic Power Saving Mode is the default setting and extends the operating time before the battery is recharged.

- The *Manual Power Saving Mode* allows selection of a performance level suited to intended operation. There are six settings ranging from the *Best Network Performance* (using the most battery power) to *Acceptable Network Performance* (using the least battery power). A network performance description is displayed for each power range.
5. Tap **OK** to implement power consumption changes for the MK2000 profile.

Note: *Power mode parameters are not persisted across power-down and power up cycles.*

Status

To view the status of the wireless network connection, select *Status* from the *Mobile Companion* menu.

1. Tap the *Signal* tab to display a real-time graph of the signal quality of the MK2000 to the associated AP (Infrastructure Mode only). The number of times the MK2000 has roamed to and from APs, the current data rate, and the network status are displayed. Signal quality is an indicator of how clearly the adapter can hear the associated AP.

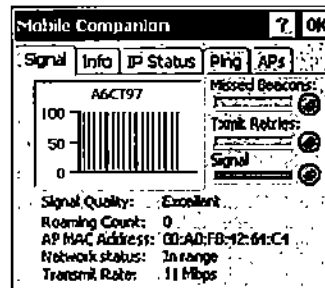


Figure B-9. Mobile Companion - Signal Tab



Missed Beacons	Displays the amount of beacons (uniform system packets broadcast by the AP to keep the network synchronized) missed by the MK2000. The fewer the missed beacons the better the signal. As long as the LED to the right of the graph is green the AP association is not jeopardized by an excess of missed AP beacons. If the LED is Red, an association with a different AP could be warranted to reduce the amount of missed beacons and improve the signal.
<i>Txmit Retries</i> (Transmit Retries)	Displays the number of data packets retransmitted by the MK2000. The fewer transmit retries the stronger the signal. As long as the LED to the right of the graph is green the AP association is not jeopardized. If the LED is red, an association with a different AP could be warranted to reduce the amount of transmit retries and improve the signal.
Signal	Displays the Relative Signal Strength Indicator (RSSI) of the signal transmitted between the AP and MK2000. As long as the LED to the right of the graph is green the AP association is not jeopardized. If the LED is red, an association with a different AP could be warranted to improve the signal.

Note: *The signal strength utility can be run by mapping a button combination to the "Signal Strength" function (0xC6). Refer to Table 6-6 on page 6-7.*

2. Tap the *Info* tab to view the MK2000's current software and driver revision data as well as the operating parameters of the current profile.

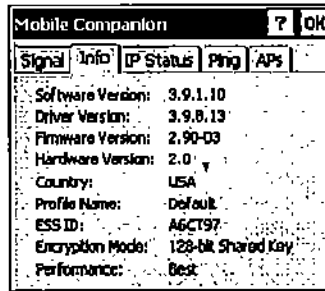
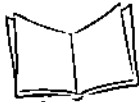


Figure B-10. Mobile Companion - Info Tab

Version Information	Displays the MK2000's software, driver, firmware and hardware versions as well as country information. This data is consistent for the MK2000 regardless of which MK2000 profile is the current profile.
Current Status	Displays the MK2000's current Profile Name, ESSID, and Encryption mode. MK2000 performance is displayed using a verbal indicator of signal strength. MK2000 operating information differs depending on which profile has been enabled as the current profile.



3. Tap the *IP Status* tab to view the MK2000's network address information. Unlike the *IP Config* tab in Finding WLANs, the *IP Status* tab is view only with no user-configurable data fields.

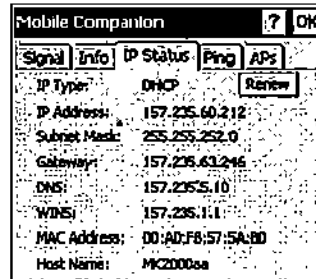


Figure B-11. Mobile Companion - IP Status Tab

IP Type	If DHCP was selected from the <i>IP Config</i> tab, leased IP address and network address data displays for the MK2000. If Static was selected, the values displayed were input manually in the <i>IP Config</i> tab on page B-10.
IP Address	Each node on the IP network must be assigned a unique IP address. Enter the <i>IP Address</i> in dotted-decimal notation, for example, 192.168.7.27.
Subnet Mask	All network adapters on a TCP/IP network must have a <i>Subnet Mask</i> defined. See your network administrator for the appropriate mask for your network.
Gateway	The <i>Gateway</i> is a device that is used to forward IP packets to and from a remote destination.

DNS	The Domain Name System (<i>DNS</i>) is a distributed Internet directory service. <i>DNS</i> is used mostly to translate domain names and IP addresses. It is also used to control Internet e-mail delivery. Most Internet service requires <i>DNS</i> to operate properly. For example, if <i>DNS</i> is not configured, Web sites cannot be located or e-mail delivery fails.
WINS	<i>WINS</i> is a Microsoft Net BIOS name server. <i>WINS</i> eliminates the broadcasts needed to resolve computer names to IP addresses by providing a cache or database of translations.
MAC Address	An IEEE 48-bit address the MK2000 is assigned at the factory that uniquely identifies the adapter at the physical layer.
Host Name	Displays the name of the MK2000.

Tap **Renew** to refresh the information displayed on the *IP Status* tab.

4. Tap the *Ping* tab to send and receive ICMP ping packets across the network to the specified IP address.

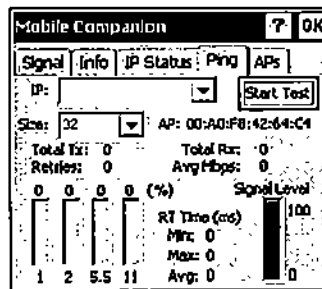


Figure B-12. Mobile Companion - Ping Tab

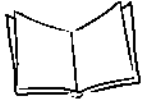
Select or enter a target device IP address from the *IP* drop-down list.

Select the size of the packet transmission from the *Size* drop-down list.

Tap **Start Test** to begin the ping test.

Tap **Stop Test** to terminate the ping test.

The average mega-bits per second, signal strength, data rate currently in use, test statistics and round trip (RT) times are displayed for each test. The associated AP



MAC address is also displayed. The signal strength level and the data transmission rate are displayed in real-time bar graphs.

5. Select the APs tab to view APs with the same ESSID as the MK2000's profile.

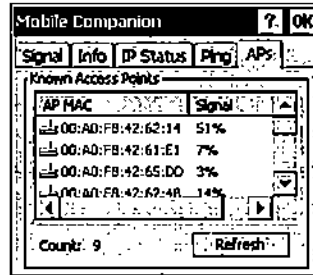


Figure B-13. Mobile Companion - APs Tab

The associated AP displays a radio wave radiating from its antenna to indicate its associated status. Tapping on the icon displays a menu with *Set Mandatory* and *Set Roaming* options.

Selecting the *Set Mandatory* item prohibits the MK2000 from associating with a different AP. The letter *M* displays on top of the icon when the *Set Mandatory* option has been selected.

Selecting *Set Roaming* allows the MK2000 to roam to any AP with a better signal. These settings are temporary and never saved to the registry.

Tap **Refresh** to update the list of the APs with the same ESSID. The APs tab only displays when Infrastructure is selected as the MK2000 operating mode from the *Mode* tab.

Setting Options

Select *Options* from the Mobile Companion menu to enable or disable international roaming, configure consumption avoidance capabilities, enable system sounds, and set temporary settings.

Note: *These parameters are not persisted across power-down and power-up cycles.*

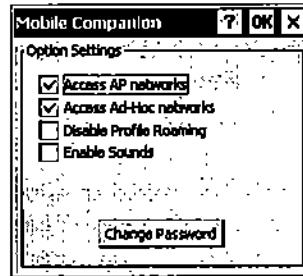


Figure B-14. Mobile Companion - Option Settings

1. Tap the *Access AP networks* check box to display available AP networks and their signal strength within the *Available WLAN Networks* tab. These are the APs available to the MK2000 profile for association. If this option was previously disabled, refresh the *Available WLAN Networks* tab to display the AP networks available to the MK2000.
2. Tap the *Disable Profile Roaming* check box to disable the MK2000 from roaming and associating to APs with country codes other than the United States.
3. Tap the *Enable Sounds* check box to initiate an audible signal when performing a ping test and associating with an AP. The tones are important to notify users if the pinging is received or if the MK2000 has roamed to another AP.

Note: *Mobile Companion has a password protection feature. When Mobile Companion initially displays, the password is off by default.*

4. To create a password, tap **Change Password**.

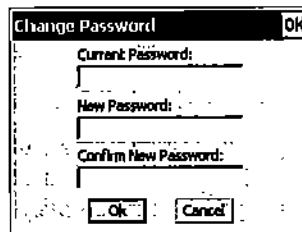


Figure B-15. Mobile Companion - Change Password



5. Enter a case sensitive password (10 characters maximum) in the *Current Password* field and tap **OK**. To change the current password, enter the current password in the *Current Password* field and enter a new password in the *New Password* and *Confirm Password* fields and tap **OK**.

Changing Profiles

Select *WLAN Profiles* from the *Mobile Companion* menu to view, connect to, create and edit a profile. A completed profile is a set of adapter configuration settings that can be used in different locations to connect to a wireless network. Creating different profiles is a good way of having pre-defined operating parameters available for use in various network environments. When the *WLAN Profiles* window initially displays, existing profiles appear in the *WLAN Profiles* list box.

For the Configuration Utility to work with a profile, the profile name must be assigned as "Default". See Figure B-3 on page B-5.

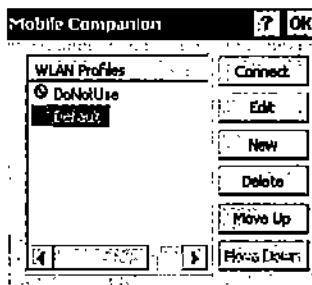


Figure B-16. Mobile Companion - WLAN Profiles

Select a profile from the list box and tap **Connect** to set that profile as the active profile. The active profile displays the transmit and receive icon to the left. Once selected, the MK2000 is using the ESSID, encryption and power consumption settings initially configured for that profile.

Editing a Profile

Select a profile from the list box and tap **Edit** to display the *Mode* tab where the ESSID and operating mode can be changed for the profile. Use the *Encryption*, *IP Config*, and *Power* tabs as necessary to edit the profile power consumption and security parameters.

Creating a New Profile

Tap **New** to display the *Mode* tab where the profile name and ESSID can be set. Use the *Encryption*, *IP Config* and *Power* tabs as required to set security, network address information and power consumption level for the new profile.

Deleting a Profile

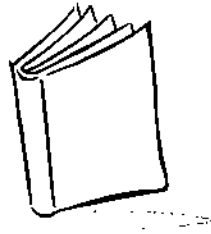
Select a profile to delete from the list box and tap **Delete** to remove the selected profile.

Ordering Profiles

Select a profile from the list box and tap **Move Up** or **Move Down** to order the profile. If the current profile association is lost, Mobile Companion attempts to associate with the first profile in the list and then the next until a new association is achieved.



MK2000 MicroKiosk Product Reference Guide



Appendix C

AirBeam Smart

Introduction

The AirBeam Smart product allows specially designed software packages to be transferred between a host computer and the MK2000. Before transfer, AirBeam Smart checks and compares the versions of the packages, so that only updated packages are transferred.

AirBeam Smart allows networked MK2000s to request, download and install software, as well as to upload files and status data. Both download and upload of files can be accomplished in a single communications session. The ability to transfer software over a radio network can greatly reduce the logistical efforts of client software management.

In an AirBeam Smart system, a network-accessible host computer acts as the storage point for the software transfer. The AirBeam Smart Client uses the industry standard FTP or TFTP file transfer protocols to check the host system for updates and if necessary, to transfer updated software.

AirBeam Package Builder

In a typical distributed AirBeam Smart system, software to be transferred is organized into packages. In general, an AirBeam Smart package is simply a set of files that are assigned attributes both as an entire package and as individual component files. The package is assigned a version number and the transfer occurs when an updated version is available.

An AirBeam Smart package can optionally contain developer-specified logic to be used to install the package. Installation logic is typically used to update client device flash images. Examples of common AirBeam Smart packages would include packages for custom client application software and AirBeam Smart Client software.



Once these packages are built, they are installed on the host server for retrieval by the device. The AirBeam Package Builder is a utility used to define, generate and install AirBeam packages to a server. The packages are then available for transfer from the server to a client device equipped with an AirBeam Smart Client.

For detailed instructions on how to define, generate and install AirBeam packages to the server, refer to the *AirBeam Package Builder Product Reference Guide*, p/n 72-55769-xx.

AirBeam Smart Client

The AirBeam Smart Client is included with the MK2000. It must be configured with the server access information, the names of the packages to be downloaded and other controlling parameters. When the AirBeam Smart Client is launched, the device connects to the specified FTP server and checks the packages it is configured to look for. If the package version was updated, the client requests the transfer.

AirBeam Smart License

The AirBeam Smart Client is a licensed software product. The AirBeam Smart Client's version synchronization functionality is enabled through a license key file that is stored on the client device. The license key file can be built into AirBeam Smart Client's image, or downloaded in a special AirBeam package.

The AirBeam Smart license key file contains a unique key and a customer specific banner that is displayed when the AirBeam Smart Client version synchronization logic is invoked.

Configuring the AirBeam Smart Client

The AirBeam application can be configured via the Configuration Utility or System Menu (refer to Table 3-8 on page 3-37), or on the MK2000 by launching AirBeam from the CE *Start* menu.

Note: It is recommended that AirBeam be set up remotely via the Configuration Utility or locally via the System Menu. If AirBeam is set up using the Configuration Utility's *mkconfig.reg* file and the file is uploaded to the MK2000, this file is used to configure the AirBeam application. However, if a user configures the AirBeam client locally on the MK2000 and the changes are intended to be permanent, the user must also select the Save Configuration command (Start/Programs/Save Configuration). This will update the current *mkconfig.reg* file in the MK2000's Application folder. Since reg files are processed oldest to newest, the settings in *\application\mkconfig.reg* will take precedence over the older settings in *\application\airbeam.reg*.

To configure AirBeam from the CE Start menu, execute the following steps:

1. Tap *Start-Programs-AirBeam Client*. The *AirBeam CE* window appears.
2. Tap *File-Configure*. The *AirBeam* configuration window appears (see Figure C-1).

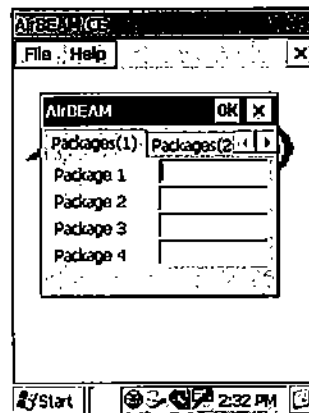
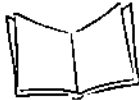


Figure C-1. AirBeam Smart Configuration Window

The configuration window is used to view and edit AirBeam Smart Client configurations. This dialog box has six tabs that can be modified - *Packages(1)*, *Packages(2)*, *Server*, *Misc(1)*, *Misc(2)* and *Misc(3)*.



Packages(1) Tab

This tab, shown in Figure C-2, is used to specify the package name of the first four of eight packages that are to be loaded during the AirBeam Smart synchronization process. The specified package name must correspond to a package that is available on the specified package server.

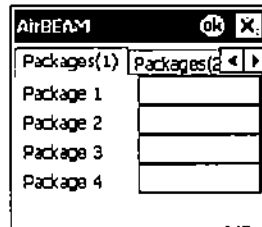


Figure C-2. AirBeam Packages(1) Tab

Field	Description
<i>Package 1</i>	Package name of the first of eight packages. This is an optional field.
<i>Package 2</i>	Package name of the second of eight packages. This is an optional field.
<i>Package 3</i>	Package name of the third of eight packages. This is an optional field.
<i>Package 4</i>	Package name of the fourth of eight packages. This is an optional field.

Packages(2) Tab

This tab, shown in Figure C-3, is used to specify the package name of the last four of eight packages that are to be loaded during the AirBeam Smart synchronization process. The specified package name must correspond to a package that is available on the specified package server.

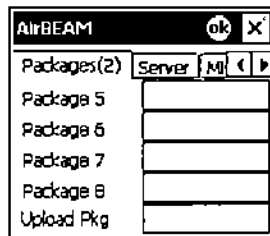


Figure C-3. AirBeam Packages(2) Tab

Field	Description
<i>Package 5</i>	Package name of the fifth of eight packages. This is an optional field.
<i>Package 6</i>	Package name of the sixth of eight packages. This is an optional field.
<i>Package 7</i>	Package name of the seventh of eight packages. This is an optional field.
<i>Package 8</i>	Package name of the eighth of eight packages. This is an optional field.
<i>Upload Pkg</i>	Package name of a package that is to be uploaded to the server during the AirBeam Smart synchronization process. The specified package name must correspond to a package that is available on the specified package server. This is an optional field.

Server Tab

This tab, shown in Figure C-4, is used to specify the configurations of the server to which the client connects during the package synchronization process.

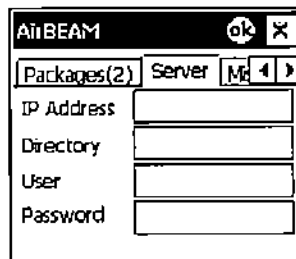


Figure C-4. Server Tab



Field	Description
<i>IP Address</i>	The IP Address of the server. It may be a host name or a dot notation format.
<i>Directory</i>	The directory on the server that contains the AirBeam Smart package definition files. All AirBeam Smart package definition files are retrieved from this directory during the package synchronization process.
<i>User</i>	The FTP user name that is used during the login phase of the package synchronization process.
<i>Password</i>	The FTP password that corresponds to the FTP user specified in the User field. The specified password is used during the login phase of the package synchronization process.

Misc(1) Tab

This tab, shown in Figure C-5, is used to configure various miscellaneous features.

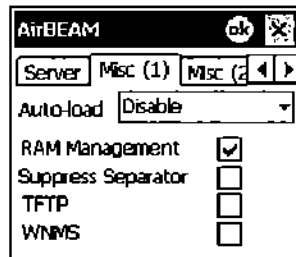


Figure C-5. Misc(1) Tab

Field	Description
<i>Auto-load</i>	<p>This drop-down list is used to specify how the AirBeam Smart Client is to be invoked automatically when the client device is rebooted. The selections are:</p> <p><i>Disable:</i> the AirBeam Smart Client is not invoked automatically during the boot sequence.</p> <p><i>Interactive:</i> the AirBeam Smart Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. The Synchronization Dialog box appears and the user is required to tap OK when the process is complete.</p> <p><i>Non-interactive:</i> the AirBeam Smart Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. The Synchronization Dialog box is displayed, but the user is not required to tap OK when the process is complete. The <i>Synchronization Dialog</i> box terminates automatically.</p> <p><i>Background:</i> the AirBeam Smart Client is invoked automatically during the boot sequence. The package synchronization process is started automatically. Nothing is displayed while the synchronization process is occurring.</p>
<i>RAM Management</i>	<p>This checkbox specifies whether the automatic RAM management is enabled during the package synchronization process.</p> <p>If enabled, RAM management logic is invoked when there is not enough free disk space to download a package. The RAM management logic attempts to remove any discardable AirBeam Smart packages resident on the client.</p>



Field	Description
<i>Suppress Separator</i>	<p>This checkbox specifies whether the automatic insertion of a file path separator character should be suppressed when the client generated server package definition file names.</p> <p>When enabled, the parameter also disables the appending of .apd to the package. This feature is useful for AS/400 systems, in which the file path separator character is a period. When this feature is enabled, the server directory (Directory) and package name (Package 1, Package 2, Package 3 and Package 4) are appended "as is" when building the name for the server package definition file.</p> <p>When this feature is disabled, a standard file path separator is used to separate the server directory (Directory) and package name (Package 1, Package 2, Package 3 and Package 4) when building the name for the server package definition file. In addition, an .apd extension is appended automatically.</p>
<i>TFTP</i>	<p>This checkbox specifies whether the TFTP protocol is to be used to download files. By default, the AirBeam Smart Client uses the FTP protocol.</p>
<i>WNMS</i>	<p>This checkbox specifies whether the AirBeam Smart Client uploads a WNMS information file at the end of each version synchronization.</p>

Misc(2) Tab

This tab, shown in Figure C-6, is used to configure various miscellaneous features.

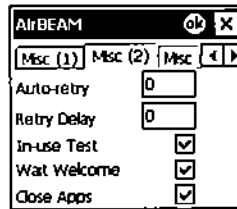


Figure C-6. Misc(2) Tab

Field	Description
<i>Auto-retry</i>	<p>This field is used to specify whether the AirBeam Smart Client automatically retries if there is a failure during the synchronization process. If this feature is enabled, the AirBeam Smart Client displays a popup dialog indicating the attempt of a retry. The popup dialog is displayed for the number of seconds specified in the <i>Retry Delay</i> field.</p> <p>The valid values for this field are:</p> <ul style="list-style-type: none"> -1: the AirBeam Smart Client automatically retries indefinitely. 0: the AirBeam Smart Client does not automatically retry. -0: the AirBeam Smart Client automatically retries up to the number of times specified.



Field	Description
<i>Retry Delay</i>	This field specifies the amount of time, in seconds, that the AirBeam Smart Client will delay before automatically retrying after a synchronization failure.
<i>In-use Test</i>	This checkbox specifies whether the AirBeam Smart Client tests to determine if a file is in-use before downloading. If the In-use Test feature is enabled, the AirBeam Smart Client downloads a temporary copy of any files that are in-use. If any temporary in-use files are downloaded the AirBeam Smart Client automatically resets the client to complete the copy of the in-use files. If the In-use Test feature is disabled, the synchronization process fails (-813) if any download files are in-use.
<i>Wait Welcome</i>	This checkbox specifies whether the AirBeam Smart Client waits for the WELCOME windows to be completed before automatically launching the synchronization process after a reset.
<i>Close Apps</i>	This checkbox specifies whether the AirBeam Smart Client automatically attempts to close non-system applications prior to resetting the mobile device. If enabled the AirBeam Smart Client sends a WM_CLOSE message to all non-system applications before resetting the mobile device. This feature offers applications the opportunity to prepare (i.e. close open files) for the pending reset.

Misc(3) Tab

This tab, shown in Figure C-7, is used to configure various miscellaneous features.

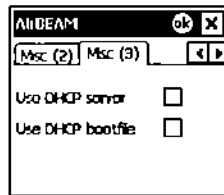


Figure C-7. Misc(3) Tab

Field	Description
<i>Use DHCP server</i>	This checkbox control specifies whether the AirBeam Smart Client uses the DHCP response option 66 to specify the <i>IP address</i> of the FTP/TFTP server.
<i>Use DHCP bootfile</i>	This check box control specifies whether the AirBeam Smart Client uses the DHCP response option 67 to specify the <i>Package</i> and <i>Package 1</i> parameters.

Synchronizing with the Server

When the synchronization process is initiated, the AirBeam Smart Client attempts to open an FTP session using the AirBeam Smart Client configuration. Once connected, the client processes the specified packages. Packages are loaded only if the server version of a given package is different from the version loaded on the client. Once the upload process is complete, the AirBeam Smart Client closes the FTP session with the server.

The AirBeam Smart Client can launch an FTP session with the server either manually, when initiated by the user, or automatically.

Manual Synchronization

1. Configure the AirBeam Smart Client. See *Configuring the AirBeam Smart Client* on page C-2.
2. From the main *AirBeam CE* window, tap *File-Synchronize*.
3. Once connected, the AirBeam Synchronize window appears.



Figure C-8. AirBeam Synchronize Window



- The Status List displays status messages that indicate the progress of the synchronization process.
- Tap **OK** to return to the Main Menu. This button remains inactive until the synchronization process is complete.
- Tap **Retry** to reattempt the synchronization process. This button is activated only if there is an error during the synchronization process.

Automatic Synchronization

The AirBeam Smart Client can be configured to launch automatically using the *Misc(1)* preference tab, see *Misc(1) Tab* on page C-6. When setting automatic synchronization, use the *Auto-load* drop-down list to specify how the AirBeam Smart Client should be invoked automatically when the client device is rebooted. See *Misc(1) Tab* on page C-6 for instructions on enabling Auto Sync.



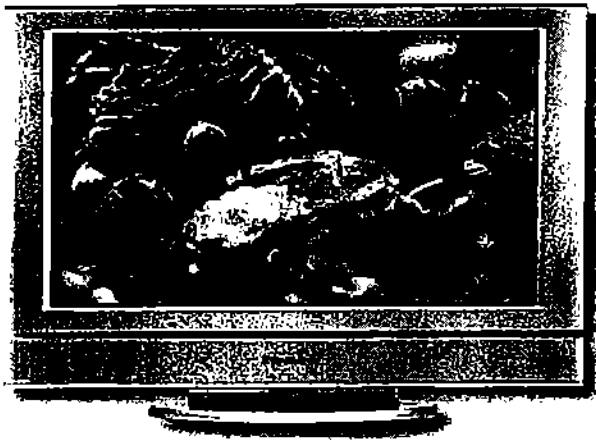
Appendix D

Demo Application Bar Codes

Demo Application Bar Codes

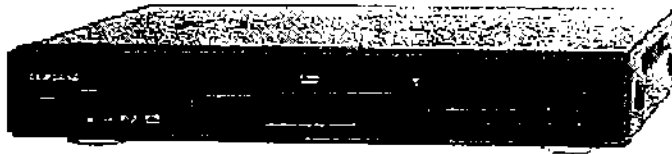
Sample bar codes are provided for use with the Demo Application.

Wide Screen TV





DVD Player



White Correction Fluid

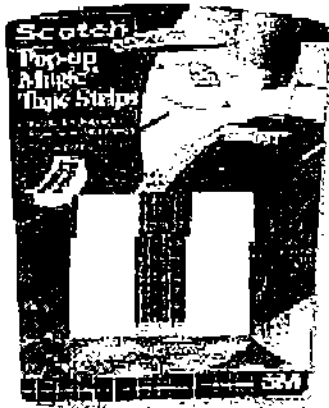


Demo Application Bar Codes

Glue Stick

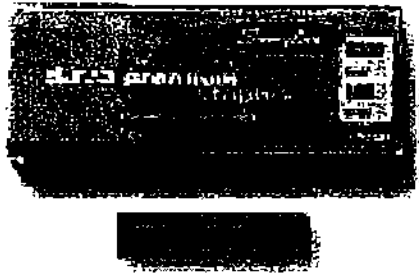


Transparent Tape





Standard Staples



Tylenol

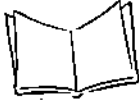


Rolaids

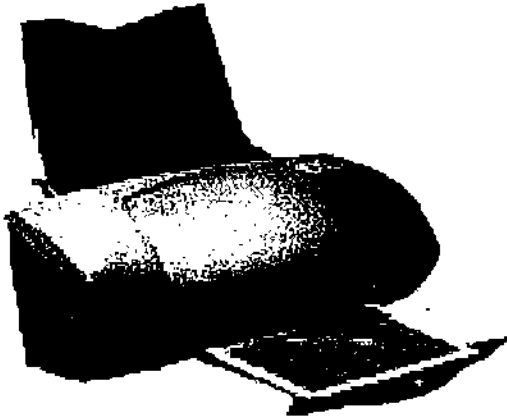


CD





Color Printer - Ink Cartridge



Employee Badge

John Ryan
(Code 128)



Loyalty Card

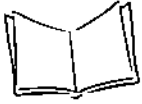
Clark Kent
(Code 39)



2D Bar Code (PDF417)



Text Reads: "You have just scanned a PDF417 bar code using the MK2000!"



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Appendix E

Terminal Configuration Manager

TCM Introduction

The Terminal Configuration Manager (TCM), is used to specify a group of files to use when creating a partition and to load partitions from a host computer into the MK2000's flash memory over a serial connection using the terminal's Initial Program Loader (IPL).

In TCM, a *script* is created that contains the information (commands to copy files) for building the image. TCM works with Explorer-type windows to view both the contents of the partitions and the source files' directory structure. Functions that can be performed include opening multiple scripts, drag drop items from a drive/directory to the script, renaming and deleting files in the script. When building the image, TCM adds all the files and directories referenced in the script to the image.

The Symbol MK2000 SDK includes TCM as well as a number of standard scripts and demos/samples to use as a base for creating new scripts. These scripts can be found under C:\Program Files\Symbol Windows CE SDK (MK2000)\Symbol Platforms\MK2000\TCMScripts.

Note: *Before creating a script to build a hex image, identify the files required (system files, drivers, applications, etc.) and locate the files' source directories to make the script building process easier.*



The required processes for building a hex image in TCM include:

- Starting TCM
- Creating or modifying a script
- Building the hex image
- Sending the hex image.

Starting Terminal Configuration Manager

To start TCM, double-click on the TCM icon in the MK2000 SDK group. The following screen appears, displaying two directory windows; *Script1* and *File Explorer*.

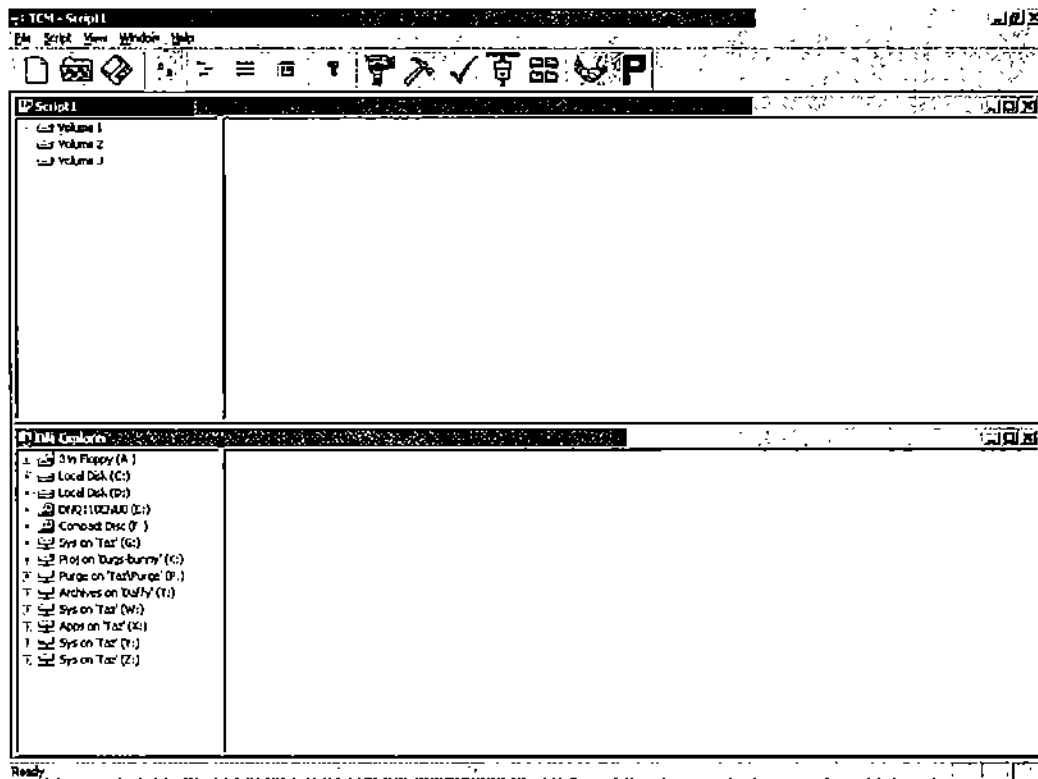
















Figure E-1. Terminal Configuration Manager

Table E-1 lists the components of the TCM start-up screen.

Table E-1. TCM Start-Up Screen Components

Component	Description			
Script Window	<p>Associated with a script file containing the information to create a Flash Disk image. This window is the <i>target</i> window, or the primary TCM window to create a script or change a script file's contents by copying, deleting and renaming files and directories. More than one script window can be open at a time.</p> <p>The Script Window consists of two panes, the Directory Tree Pane on the left and the Directory Contents Pane on the right. Subordinate directories and files of each partition are listed in the Directory Contents Pane.</p>			
File Explorer	<p>A <i>read-only source</i> window for files and/or directories to include in the script being built.</p>			
Tool Bar	<p>Contains the tools, illustrated below, for taking action on a script.</p>			
		Create a new script file.		Check script for existing files.
		Open a script file.		Select the hex image to load.
		Save a script file.		Tile windows.
		View script properties.		Build and send the hex image to the terminal.
		Build a script.		Preferences.
		View large icons.		About TCM.
		View small icons.		View list.



Defining Script Properties

Before a script is created, the script properties must be defined. This defines the type of terminal, flash type, number of disks being created and the memory configuration of each disk partition.

To define the script properties:

1. With TCM open, click on the Script Window to make it the active window.
2. From the *Script* menu, select the *Properties* option.

OR

Click on  from the tool bar. The *Script Properties* window displays.

3. From the *Terminal* drop-down menu, select MK2000.
 4. From the *Disks* drop-down menu, select the number of disk partitions to be created.
-

Note: *The options available under the disks drop-down menu changes depending on the flash type. Some flash types only have one option for the number of disk partitions, others have two options.*

5. If two or more partitions have been selected under the *Disk* drop-down menu, the memory configuration of the two partitions may be changed. Click on the up or down arrow for either of the partitions, until the memory configuration of each is set to the desired value. As the one partition's size is changed, the other partition is automatically changed accordingly.
6. For each disk partition, determine the Read/Write access option.
7. The Script File Path displays the path of the selected script file.
8. Select a Cushion percentage from the *Cushion* drop-down menu to specify the percent of flash reserved for cushion. Choosing a higher number reduces disk storage space, but also increases write performance on fragmented disks or disks becoming full. To speed the writing process, select as high a number as storage needs permit (up to 25%).
9. Click **OK** to complete the settings.

Creating the Script for the Hex Image

On start-up, TCM displays the screen shown on page E-2, with the Script1 window and File Explorer window pointing to the following directory:

**C:\Program Files\Symbol Windows CE
SDK(MK2000)\SymbolPlatforms\MK2000\TCMScripts**


The Script1 window directory pane displays three partitions: Volume1, Volume2 and Volume3. Depending on the type of flash chip, the number of partitions may change. Files can be added to each of the partitions. TCM functionality includes:

- Create a new script file or open an existing script
- Drag and drop existing files and directories to that script
- Set the script parameters
- Save the script
- Review and modify the script.


Each process is described in the sections that follow.

Open a New or Existing Script

Scripts are created in the Script Window. To open a new script:

- Choose *New* from the *File* menu, OR
- Click on  from the tool bar.

To open an existing script (e.g., a standard script provided in the SDK):

- Choose *Open* from the *File* menu and select the script file name, OR
- Click on  from the toolbar and select the script file name, OR
- Double-click on an existing script in the Script Browser window.



Note: *If an existing script is opened and changes are made, saving the changes writes over the original script. To use an original or Symbol-supplied standard script as a base and save the changes in a new script, use Save As instead of Save after making the changes and save to a different filename.*

Copy Components to the Script

To copy files or directories to the script being generated:


1. Click on the File Explorer Window to make it the active window.
2. Click on the source directory in the Directory Tree Pane. TCM displays the directory contents in the Contents Pane.
3. Click on the file(s) and/or directory in File Explorer.

Note: *Optionally, use the standard Windows® Shift+Left-tap and Control+Left-tap features to select multiple files and directories.*

4. Drag and drop the selected file(s) and/or directory from File Explorer to the target directory in the Script Window,
OR
Click on the target directory and select the File Explorer Copy icon from the toolbar.


Save the Script

To save the changes to a new script:

1. From the *File* menu, choose *Save As*,
OR
On the toolbar, click on .
2. Enter the path and filename. TCM appends a .TCM extension to the script.
3. Click **OK**.

Note: *TCM by default saves untitled scripts to the directory that the Script Browser is pointing to.*

To save changes to an existing script:

- From the *File* menu, choose *Save*, OR
- On the toolbar, click  .

Note: *Saving changes to an existing script, writes over the original script.*


To use an original or Symbol-supplied standard script as a base and save the changes in a new script, use *Save As* instead of *Save* after making the changes and save to a different filename.

Building the Image

As part of the build, TCM performs a check on the script which verifies that all files referenced in the script exist.

Note: *Performing a check is more important for previously existing scripts to ensure that files referenced in the script are still in the designated locations.*

To check a script:

1. In the Script Window, select the script.
2. Save the script, if not already saved.
3. From the *Script* menu, choose *Check*,
OR
On the toolbar, choose  .
4. TCM verifies that files referenced in the script exist on available drives and lists an error message in the Errors found box for any missing files.
5. Click **OK** to exit.



To build a script:

1. In the Script Window, select the script to be built.
2. From the *Script* menu, select *Build*,

OR

On the toolbar, choose . The Configure Build window appears.

3. Select the item to build. If an application is selected to build, specify the application.
4. Select Compression for the hex image, which reduces the size of most hex images in order to speed downloading. Click **OK**.
5. TCM performs a check. If the script is has no errors, TCM proceeds with the building the partition.
6. Which can be transferred via IPL to the MK2000 as a hex file.

If the Build Fails

If the build fails, TCM displays a message indicating which file(s) are missing.

If the total amount of flash required by the script exceeds the image size, a TCM error results. To correct this, reduce the number of files in the partition. Refer to *Defining Script Properties* on page E-4 for more information on setting the image size appropriately.

Sending the Hex Image

Once the hex file is built, download it to the terminal using IPL. Refer to *Upgrade Procedures* on page F-1 for detailed procedures.

Saving the Script

If changes were made to the script since last saving it, save the script again.

TCM Error Messages

TCM validates the cells in the partition table when the **Execute** button is selected. Cells highlighted in red contain an error. Partition loading is disabled until all errors are corrected. Following are errors that TCM may encounter and possible solutions.

Table E-2. TCM Errors

Error	Description
Error - Partition Size	The size of a partition must be an integral multiple of the <code>FFSSectorSizeInBytes</code> specified by the <code>.ini</code> file. When the user enters a partition size, TCM rounds up to the next highest integral multiple of the sector size and displays this value in the partition table grid. This error check is made upon value entry, independent of the Execute button.
Error - Image Larger than Partition	If the required size of the binary image file is larger than the associated partition size, the Partition Size cell in the partition grid turns red to highlight the error. The Required Size cell indicates the actual size required.
Error - Total size of all FFS Partition	If the total memory allocated to the 3 FFS partitions is greater than the total Flash Memory on the MK2000, the Used FFS Memory display box turns red. Decrease the size of one or more of the partitions, then recheck the configuration using the Execute button.
Error - Source/ Destination Path Verification	If the directory paths specified by the Source and Destination cells do not exist, the cell containing the non-existent path turns red to highlight the error.

Creating a Splash Screen

The Splash Screen is briefly displayed when the terminal cold boots. To generate a custom splash screen, use a bitmap editor, such as *Paintbrush*.

Creating a Splash Screen on Color Terminals

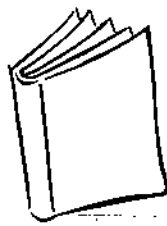
1. Create a 8 or 16 bit color bitmap with dimensions of BX x BY where:
 - BX is less than or equal to 640 pixels
 - BY is less than or equal to 480 pixels
2. Choose **Build**, and then check at least the **Splash Screen** item. You may build the splash screen along with any other partition images you wish. Click **OK**.
3. You are now presented with a *File Open* dialog where you must select the source file for the splash screen. Select the bitmap created above.



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4. You are now presented with a Save As file dialog to specify the output filename for the splash screen.
5. As soon as the output file is specified, TCM creates the splash screen HEX file and any other HEX files you have requested.

Note: *Using a splash screen that is larger than 640 x 480, in either dimension, or that is not 8 or 16 bit color, will cause the image to be ignored by the MK2000. Images smaller than 640 x 480 will be centered in the display.*



Appendix F

Upgrade Procedures

Overview

The MK2000 Upgrade functions allow the user to upgrade the MK2000 with software updates and/or feature enhancements. This appendix provides examples of upgrading using a Compact Flash card and the Initial Program Loader. Other methods of upgrade are described in other sections, including Appendix C, *AirBeam Smart* and Appendix E, *Terminal Configuration Manager*.

Partition Update vs. File Update

There are two types of updates supported by the MK2000: partitions and files.

The file system used by the MK2000 is organized similarly to the file system on a desktop computer. A file is a unit of data that can be accessed using a file name and a location in the file system. There are two contexts in which a file can be replaced: when part of the operating system image, or on a flash file system. When a file is replaced on a flash file system, it destroys the contents of the previous file. When a file that is part of the operating system image (Windows, generally) is "replaced", the original file is not overwritten (because it is in ROM). Instead, the new file exists in the volatile RAM file system called the Object Store, and all references to the ROM file are redirected to the RAM version. The important implication of this is that files replaced on flash filesystems will survive a cold boot, whereas operating system file updates will be lost on a cold boot/power cycle. The operating system must be running for a file to be updated.

A typical partition is a group of files combined into a single "partition" that represents a specific area of storage. Examples of partitions are the operating system, or a flash file system, such as platform or application. (Using the desktop computer comparison a



partition is equivalent to a C: or D: hard disk drive.) When a partition is updated, all data that was previously in its storage region is erased - i.e., it is not a merge but rather a replacement operation. Typically, the operating system is not running when partitions are updated.

Partition images for selected partitions can be created using TCM. Refer to *Terminal Configuration Manager* on page E-1 for details. The partition image is then transferred to the MK2000 using one of the tools listed below.

Different utilities are used for partition and file updates. The type of update that can be performed for a given tool is listed in the accompanying description.

Upgrade Requirements

Upgrade requirements:

- Compact Flash (CF) card with the appropriate upgrade files

Caution

While any of the access covers are removed, the user must follow proper ESD (Electro-Static Discharge) precautions to avoid damaging sensitive components. Proper ESD precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions may cause damage to the MK2000 and could potentially void your warranty.

- ESD mat and equipment required to ensuring that the operator is properly grounded.

Note: A PC card may be substituted for the CF card on MK2000s that do not have an RF radio card. The PC card uses the same slot as the RF radio card. Removing the RF radio card is not recommended.

MK2000 Operating System Upgrade

Refer to the pages listed, to upgrade the following MK2000 Operating System (OS) components:

- OS upgrade, see *page F-5*
- Monitor upgrade, see *page F-9*
- Platform upgrade, see *page F-13*.

To upgrade the MK2000 Demo Application, see *page F-16*.

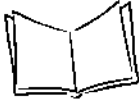
IPL Menu Navigation

Initial Program Loader (IPL) is a menu-based method of downloading partitions to non-volatile storage (flash) on the MK2000. Refer to *Upgrade Procedures* on page F-1. The following partitions can be downloaded:

- OS Partition
- Platform Partition
- Application Partition
- Data Partition
- Partition Table
- Splash Screen
- Monitor.

Note: *If an update includes a new partition table, it should be upgraded first.*

The IPL Menu selection screens use the MK2000's first three buttons to navigate the menus and make selections.



The button functions for using the menus are:

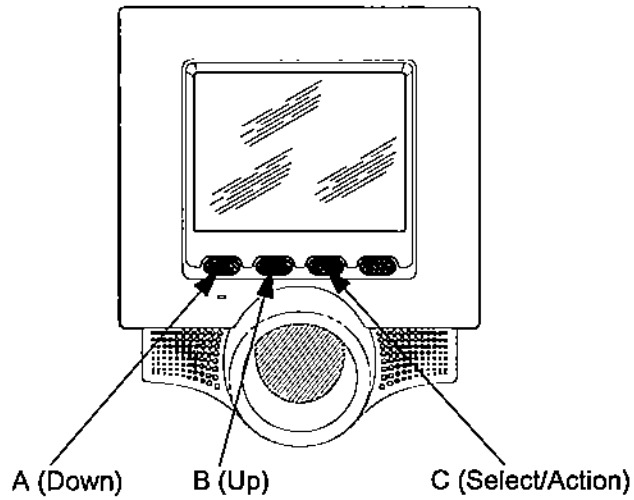


Figure F-1. Button Functions

Use the **A** button (Down) to scroll down, the **B** button (Up) to scroll Up and the **C** button (Select/Action) to select menu options.

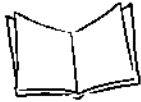
OS Upgrade

The IPL mode is used to upgrade the MK2000 OS.

IPL Mode, OS Upgrade Procedures

The OS upgrade procedures consists of nine steps:

- Insert the CF card
 - Enter IPL mode
 - Set OS upgrade
 - Select the file media source
 - Select OS upgrade file
 - Initiate download
 - OS upgrade, downloading message
 - Upgrade complete message
 - Restore MK2000.
-
1. Remove the CF access cover (see Figure 1-2 on page 1-4) and insert the CF Card into the CF Card slot.
 2. Enter IPL Mode. If the MK2000 is not in the IPL main menu, power up the MK2000 while pressing the **A** button (Down) to enter the *IPL* main menu. The *IPL* main menu displays.



3. **Select OS Partition Upgrade** - see Figure F-2. When a partition is used it refers to any download component in the Mk2000 (such as OS). Use the **A** button (Down) to scroll down to the *Windows® CE* option and select the option using the **C** button (Select/Action).

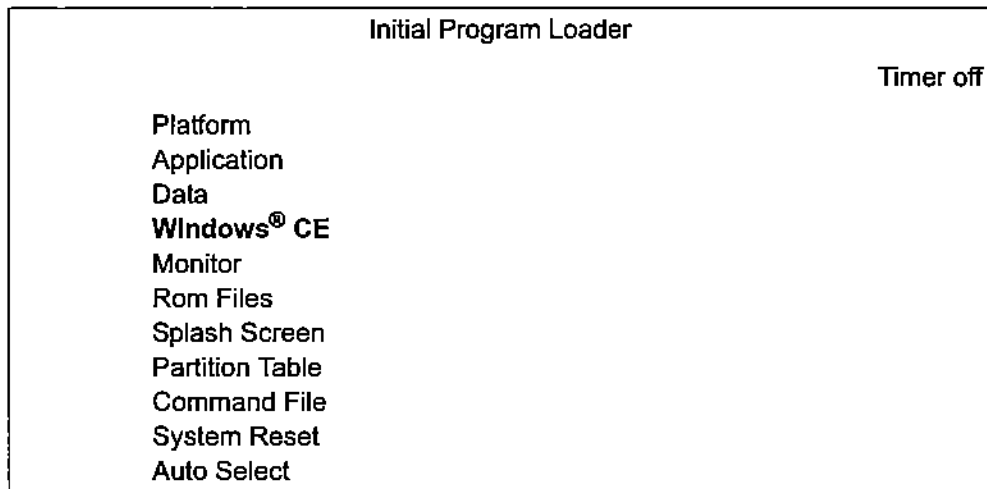


Figure F-2. IPL Mode Menu

4. **Select the File Media Source** - see Figure F-3. The *Select Transport* menu displays. Use the **A** button (Down) to highlight *CF Card*, and select using the **C** button (Select/Action).

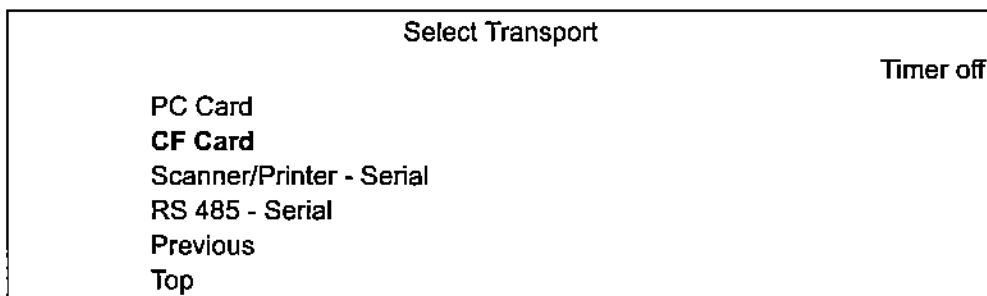


Figure F-3. Select Transport Menu

5. **Select the OS Upgrade File** - see Figure F-4. The *Select File Name* menu is displayed. Use the **A** button (Down) to highlight MK2000OS-1_1_1.bgz and select using the **C** button (Select/Action).

Note: MK2000OS-1_1_1.bgz is the upgrade file.

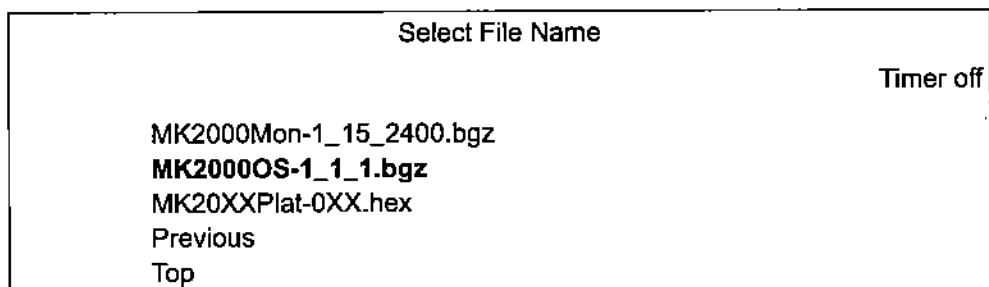


Figure F-4. Select File Name Menu

6. **Initiate Download** - see Figure F-5. The *Download File?* menu is displayed. Select *Download* using the **C** button (Select/Action) to initiate the OS Upgrade.

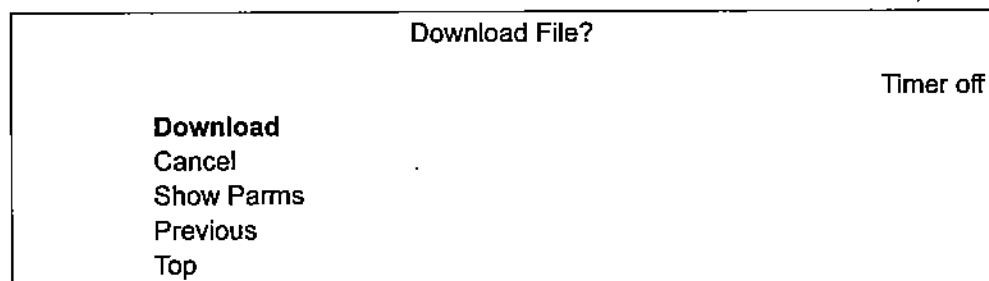


Figure F-5. Download File? Menu



7. **OS Upgrade, Downloading Message** - see Figure F-6. When the OS upgrade has initiated, the following message is displayed (this can take 5-10 minutes):

```
Windows CE
Downloading:
via CF Card MK2000OS-1_1_1.bgz
#####_ 95%"
```

Figure F-6. OS Upgrade, Downloading Message

8. **Upgrade Complete Message** - see Figure F-7. When the new OS is successfully loaded, the following message is displayed:

```
Downloading:
via CF Card MK2000OS-1_1_1.bgz
Result was: Success!
Press Enter to continue
```

Figure F-7. OS Upgrade, Success! Message

Note: When the message *Press Enter to continue* appears, press the **C** button.

9. **Restore MK2000** - if no additional upgrade procedures are required, remove power from the MK2000, remove the CF card, replace the CF access cover (see Figure 1-2 on page 1-4) and restore power to the MK2000. The new operating system automatically boots up.

Monitor Upgrade

Note: Failures during the Monitor upgrade often render the MK2000 inoperable. If the MK2000 does not boot after performing a monitor update, contact Symbol Support.

Monitor Upgrade Procedures

The Monitor upgrade procedures consists of nine steps:

- Insert the CF card
 - Enter IPL mode
 - Select monitor upgrade mode
 - Select the file media source
 - Select monitor upgrade file
 - Initiate download
 - Monitor upgrade, downloading message
 - Upgrade complete message
 - Restore MK2000.
1. Remove the CF access cover (see Figure 1-2 on page 1-4) and insert the CF Card into the CF Card slot.
 2. Enter IPL mode. If the MK2000 is not in the IPL main menu, power up the MK2000 while holding the A button (Down) see Figure F-1 on page F-4 to enter the *IPL* main menu. The IPL main menu is the first menu displayed.



3. **Select the Monitor upgrade mode** - see Figure F-8. Use the **A** button (Down) to scroll down to the *Monitor* option and select the option using the **C** button (Select/Action).

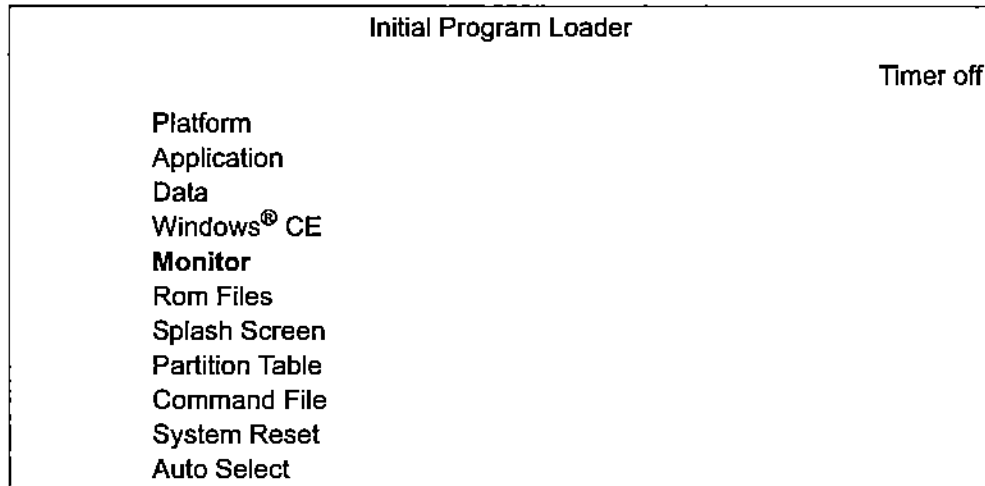


Figure F-8. IPL Mode Menu

4. **Select the File Media Source** - see Figure F-9. The *Select Transport* menu is displayed. Use the **A** button (Down) to highlight *CF Card* and select using the **C** button (Select/Action).

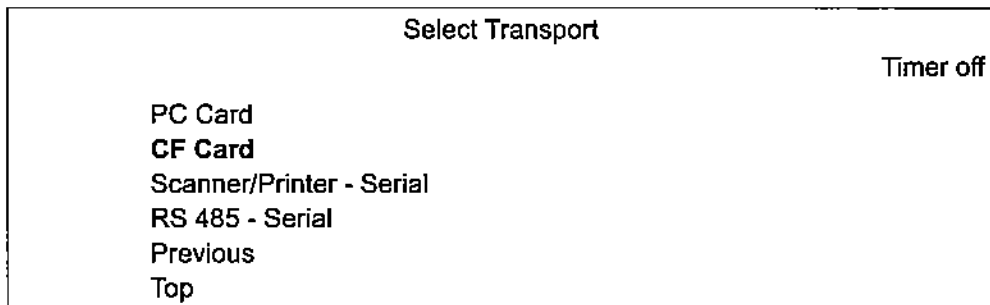


Figure F-9. Select Transport Menu

5. **Select the Monitor Upgrade File** - see Figure F-10. The *Select File Name* menu is displayed. Use the **A** button (Down) to highlight MK2000Mon-1_15_2400.bgz and select using the **C** button (Select/Action).

Note: MK2000Mon-1_15_2400.bgz is the monitor upgrade file.

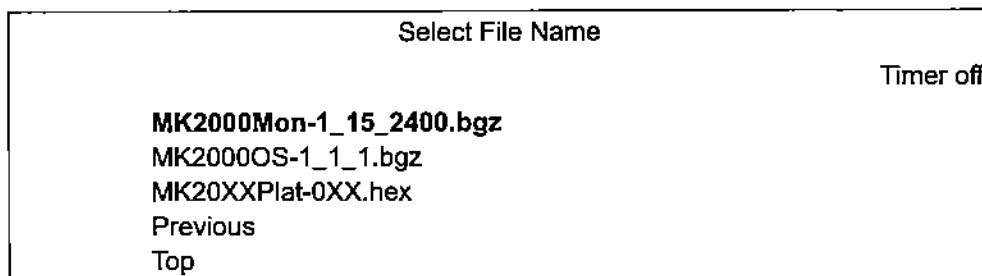


Figure F-10. Select File Name Menu

6. **Initiate Download** - see Figure F-11. The *Download File?* menu is displayed. Select *Download* using the **C** button (Select/Action) to initiate the Monitor upgrade.

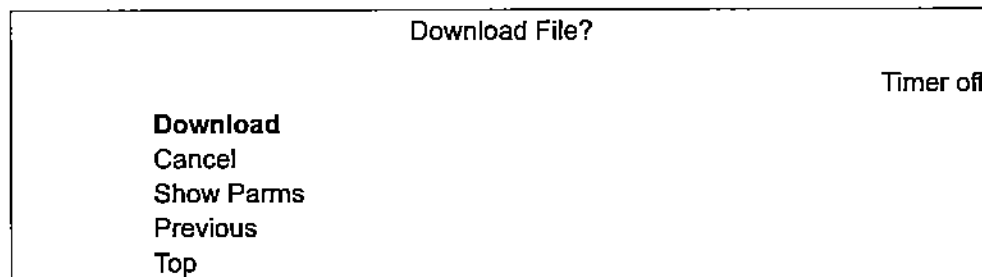


Figure F-11. Download File? Menu



7. **Monitor Upgrade, Downloading Message** - see Figure F-12. When the Monitor upgrade has initiated, the following message is displayed:

```
Windows CE
Downloading:
Via CF Card MK2000Mon-1_15_2400.bgz
##### 100%"
```

Figure F-12. Monitor Upgrade, Downloading Message

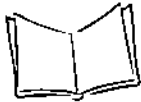
8. **Upgrade Complete Message** - When the new Monitor is successfully loaded, the MK2000 reboots automatically:
9. **Restore MK2000, Upgrade Procedures Completed** - If no additional upgrade procedures are required, remove power from the MK2000, remove the CF card, replace the CF access cover (see Figure 1-2 on page 1-4) and restore power to the MK2000. The upgrade automatically boots up.

Platform Upgrade

Platform Upgrade Procedures

The *Platform* Upgrade procedures consists of the following steps:

- Insert the CF card
 - Enter IPL mode
 - Select *Platform* upgrade mode
 - Select the file media source
 - Select the *Platform* upgrade file
 - Initiate download
 - Platform upgrade, downloading message
 - Platform successfully loaded
 - Re-Boot.
1. Remove the CF access cover (see Figure 1-2 on page 1-4) and insert the CF Card into the CF Card slot.
 2. **IPL mode menu** - if the MK2000 is not in the *IPL* mode menu, power up the MK2000 while holding the A button (Down) to enter the *IPL* mode menu. The *IPL* mode menu is the first menu displayed.



3. **Select the Platform Upgrade Mode** - see Figure F-13. Use the **B** button (Up) to scroll up to the *Platform* option and select the option using the **C** button (Select/Action).

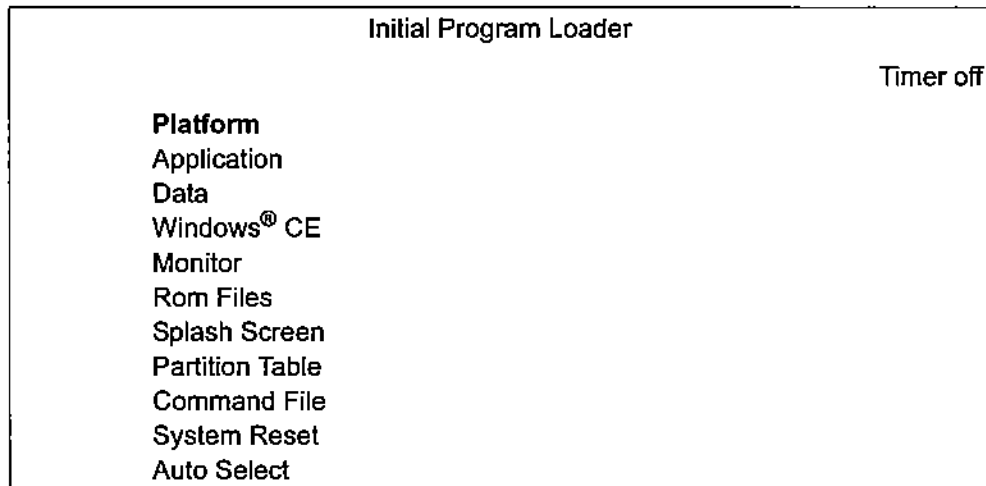


Figure F-13. IPL Mode Menu

4. **Select the File Media Source** - see Figure F-14. The *Select Transport* menu is displayed. Use the **A** button (Down) to highlight *CF Card* and select using the **C** button (Select/Action).

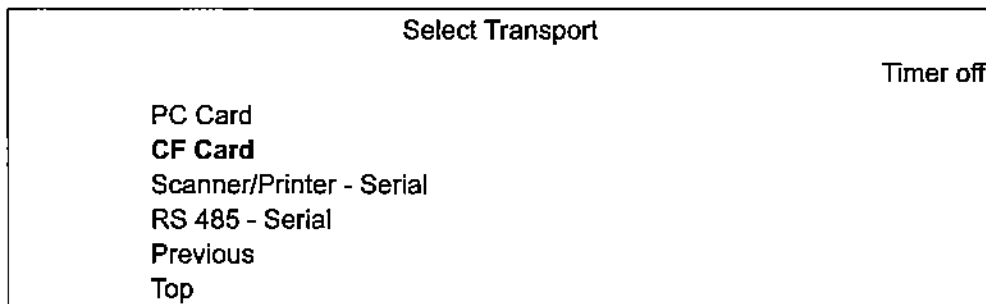


Figure F-14. Select Transport Menu

5. **Select the Platform Upgrade File** - see Figure F-15. The *Select File Name* menu is displayed. Use the **A** button (Down), to highlight MK20XXPlat-0XX.hex and select using the **C** button (Select/Action).

Note: MK20XXPlat-0XX.hex is the upgrade file.

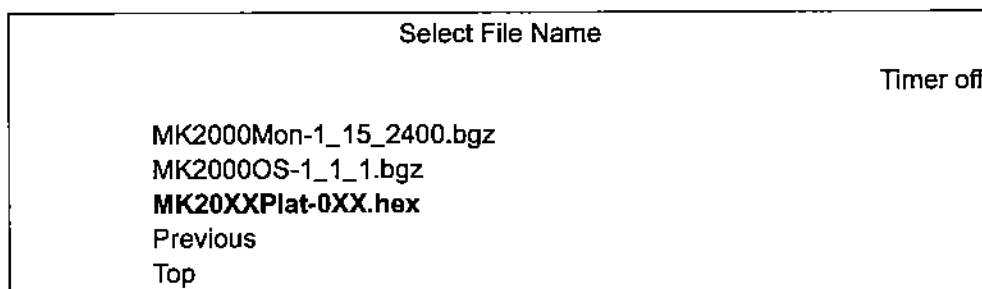


Figure F-15. Select File Name Menu

6. **Initiate Download** - see Figure F-16. The *Download File?* menu is displayed. Select *Download* using the **C** button (Select/Action) to initiate the Partition Table Upgrade.

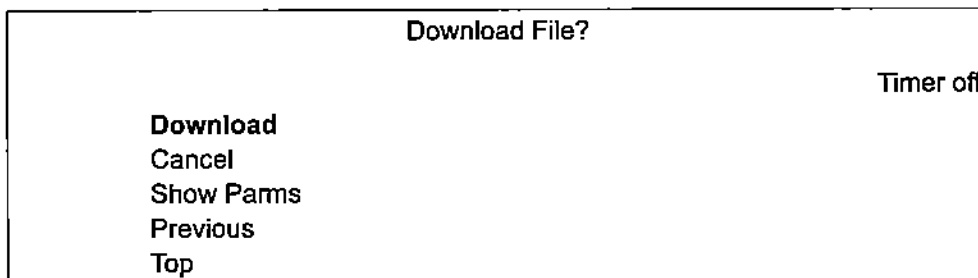
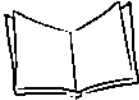


Figure F-16. Download File? Menu



- 7. Platform Upgrade, Downloading Message** - see Figure F-17. When the Platform upgrade has initiated, the following message is displayed:

```
Platform Table
Downloading:
Via CF Card MK20XXPlat-0XX.hex
##### 100%"
```

Figure F-17. Platform Upgrade, Downloading Message

- 8. Platform Successfully Loaded Message** - see Figure F-18. When the new Platform Table is successfully loaded the following message is displayed:

```
Result was: Success!
Press Enter to Continue
```

Figure F-18. Platform is successfully loaded, Success! Message

Note: When the message *Press Enter to continue* appears, press the **C** button.

- 9. Re-Boot** - if no additional upgrade procedures are required, remove power from the MK2000, remove the CF card, replace the CF access cover (see Figure 1-2 on page 1-4) and restore power to the MK2000. The upgrade automatically boots up.

Demo Application Install/Upgrade

Demo Application Install/Upgrade Procedures are provided in *Installing the Resident Demo Application* on page 5-3.



Appendix G

Troubleshooting

Troubleshooting

Troubleshooting topics are listed in Table G-1 on page G-2. The first column lists possible problems or frequently asked questions. The second column suggests a possible cause (if applicable). The third column provides a solution for correcting the problem, or references the section in this PRG that provides information on the topic.

Troubleshooting topics include:

- The MK2000 does not turn on.
- The MK2000 does not respond to polls from the host computer.
- The MK2000 does not send data to host computer.
- How to Re-Boot the MK2000.
- How to enter Windows® Protected Mode (Windows® CE desktop).
- How to load files into the MK2000.
- The Demo Application does not work after changes were made to the MK2000.
- How do I configure the MK2000?
- Built-in scanner does not recognize configuration barcodes.
- Parameter changes made via System Menu were not retained after the MK2000 was re-booted.
- Reg files values are not being copied into the Registry at boot time.
- The pen has poor calibration.
- AirBeam Smart Client settings do not match the AirBeam parameters in mkconfig.reg.
- I can't select the **Start** button.



- My wireless MK2000 doesn't retain its WEP Key encryption.
- After configuring my wireless MK2000 using the mkconfig.reg file, Mobile Companion is not automatically launched.
- The Mobile Companion icon is not visible in the task tray.
- I tried to download files to the MK2000 directly from a .zip file on my computer using ActiveSync, but I got a message that there is not enough free disk space to copy the application.
- What happens if both an AC power supply as well as a BIAS-T power supply are connected to the MK2000 at the same time?
- How do I Track Application Versions?
- Flash filesystem is corrupted.

If the problem cannot be corrected, refer to *Read MK2000 Settings* on page G-6 to obtain system information, prior to calling for service help.

Table G-1. Troubleshooting

Problem	Possible Causes	Possible Solutions
MK2000 does not turn on.	No power to the MK2000.	<ul style="list-style-type: none"> - Power via AC outlet <ul style="list-style-type: none"> - Check power to the MK2000. Ensure the Symbol approved power supply is plugged into an AC power source and connected to the MK2000 power connector. See Figure 1-3 on page 1-5. - Power via power-over-Ethernet <ul style="list-style-type: none"> - Confirm 8-wire Ethernet cable is plugged into MK2000 LAN port. - Confirm other end of Ethernet cable is plugged into Bias-T Power-Over-Ethernet (POE). - Confirm Bias-T POE power supply is plugged into an AC outlet. - Perform continuity check on the Ethernet cable.
MK2000 does not respond to polls from the host computer.	No communication between the host and MK2000.	<p>Check cabling to the MK2000. Ensure the MK2000 address is the address being polled.</p> <p>Check communication parameters.</p>

Table G-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
MK2000 does not send data to host computer.	MK2000 is not programmed to work with the host. MK2000 is not connected to the host.	Check setup communication parameters. Check cables to host computer.
How to Re-Boot the MK2000.		To perform a cold boot press and hold buttons B and C until the display goes blank (typically 15 seconds) then release the buttons. See Figure 1-1 on page 1-3. The MK2000 reboots.
How to enter Windows [®] Protected Mode (Windows [®] CE desktop).		To enter Windows [®] Protected Mode refer to <i>Accessing the Windows[®] CE Desktop</i> on page 6-5.
How to load files into the MK2000.		Refer to <i>Downloading the Configuration File to the MK2000</i> on page 3-11.
Demo Application does not work after changes were made to the MK2000.	Demo program parameter settings inconsistent with latest program changes and/or corrupt files. Reload the Demo Application.	Locate and delete the files associated with the Demo Application (located in the My Computer/Application folder). Then reload the files associated with the demo application. For detailed instruction on loading the demo application, refer to <i>Installing the Resident Demo Application</i> on page 5-3.
How do I configure the MK2000?		Refer to <i>Setup and Configuration</i> on page 3-1.
Built-in scanner does not recognize configuration barcodes.	The scan driver does not support parameter barcode scanning	The scanner must be configured programmatically.
Parameter changes made via System Menu were not retained after the MK2000 was re-booted.	Parameter changes were not saved.	Refer to <i>Setting Defaults Using System Menu</i> on page 3-40.

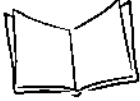


Table G-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
Reg files values are not being copied into the Registry at boot time.	More than one .reg file and duplicate registry entries are present.	Review all .reg files in /Application and /Platform and ensure they have no conflicts. The files are processed chronologically.
The pen has poor calibration.	The screen was not properly calibrated, or is off-center.	Refer to <i>Stylus Settings/Touch Screen Calibration</i> on page 3-46
AirBeam Smart Client settings do not match the AirBeam parameters in mkconfig.reg.	AirBeam Smart Client has saved a new set of override parameters in airbeam.reg when configure was used.	Delete airbeam.reg.
I can't select the Start button.	The stylus is not calibrated properly.	Simultaneously press and release buttons A , C and D . This command proceeds directly to the stylus calibration. Follow the on-screen instructions.
My wireless MK2000 doesn't retain its WEP Key encryption after a reboot.	The Profile Name in the Mobile Companion Mode tab not properly named.	Assign a Profile Name of "Default" in the Mode tab. This field is case-sensitive - it must be entered as a capital "D" and lower case "efault". Remember to save the configuration.
After configuring my wireless MK2000 using the mkconfig.reg file, Mobile Companion is not automatically launched.	The Profile Name in the Mobile Companion Mode tab not properly named.	Assign a Profile Name of "Default" in the Mode tab. This field is case-sensitive - it must be entered as a capital "D" and lower case "efault". Apply all settings desired, including encryption keys, to this profile. Remember to save the configuration.

Table G-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
The Mobile Companion icon is not visible in the task tray.	Poor RF Card connection or bad RF Card.	Remove the PCMCIA card cover at the RF card location (refer to <i>Installing/Removing RF Card</i> on page 2-29). Press the card ejector button to release the card, then press the card back into its connector to secure it in place. Reboot the MK2000. Check for the Mobile Companion icon in the task tray. Replace the RF Card if the icon is still not visible.
I tried to download files to the MK2000 directly from a .zip file on my computer using ActiveSync, but I got a message that there is not enough free disk space to copy the application.	Improper download sequence.	Files cannot be download directly from a .zip file. First extract the files to the host computer, then transfer the files to the MK2000 using ActiveSync.
What happens if both an AC power supply as well as a BIAS-T power supply are connected to the MK2000 at the same time?		The MK-2000 will only draw power from the power source providing the highest power output.
How do I Track Application Versions?		Refer to <i>User Application Version Reporting</i> on page 6-4.
Flash filesystem is corrupted.	May be due to reset or power loss during write to filesystem.	Format filesystem and re-install partition data.



Read MK2000 Settings

If an MK2000 has been configured to automatically launch an application on power-up, this auto-boot must be bypassed when the system is booted to access the Windows® CE Desktop. Refer to *Accessing the Windows® CE Desktop* on page 6-5.

1. Select **Start** from the Windows® task bar
2. Select **Settings** from the Start menu
3. Select **Control Panel** from the Settings window
4. Select **MK2000** identification from the Control Panel window. The following information is provided:
 - Device Name:
 - Description:
 - OS Version:
 - Monitor Version:
 - Display Type:
 - Memory Sizes:

Troubleshooting Notes

Changes made while configuring the MK2000 system menu screens must be saved and the MK2000 rebooted before the changes will take effect.

Most Control Panel changes take effect immediately. However, *Start/Programs/Save Configuration* must be selected from the MK2000 Start bar to save the changes.



Appendix H

Setting Scanner Parameters

Overview

This chapter describes the scanning default parameters for the MK2000. Software Programmers will find the information in this chapter useful when developing applications that control the MK2000's scan engine.

Default Table

Table H-1 lists the default values for the MK2000's SE3223 Scan Engine. These values can be changed within an application, and in the case of HTML (browser) applications, can be set independently for each web page.

For details on how to change the settings in an application, refer to the *MK2000 SDK (Software Development Kit)*, p/n MK2000CESDK-x.xx.

For a sample HTML application that includes source code and demonstrates scan engine control, refer to Chapter 5, *Resident Demo Application*.



Table H-1. Scanning Default Table

Parameter	Parameter Number	Default
Scanning Options		
Beeper Tone	91h	High Frequency
Laser On Time	88h	5.0 sec
Power Mode	80h	Continuous
Trigger Mode	8Ah	Host
Scanning Mode	8Dh	Smart Raster
Aiming Mode	F0h 7Eh	Disabled
Raster Height	E4h	100
Raster Expansion Rate	E5h	11
Time Delay to Low Power	92h	30 sec
Time-out Between Same Symbol	89h	0.9 sec
Time-out Between Different Symbols	90h	0.0 sec
Beep After Good Decode	38h	Enable
Transmit "No Decode" Message	5Eh	Disable
Parameter Scanning	ECh	Disable
Linear Code Type Security Levels	4Eh	2
Bi-directional Redundancy	43h	Disable
UPC/EAN		
UPC-A	01h	Enable

Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
UPC-E	02h	Enable
UPC-E1	0Ch	Disable
EAN-8	04h	Enable
EAN-13	03h	Enable
Bookland EAN	53h	Disable
Decode UPC/EAN Supplementals	10h	Ignore
Decode UPC/EAN Supplemental Redundancy	50h	5
Transmit UPC-A Check Digit	28h	Enable
Transmit UPC-E Check Digit	29h	Disable
Transmit UPC-E1 Check Digit	2Ah	Disable
UPC-A Preamble	22h	System Character
UPC-E Preamble	23h	No Preamble
UPC-E1 Preamble	24h	No Preamble
Convert UPC-E to A	25h	Disable
Convert UPC-E1 to A	26h	Disable
EAN-8 Zero Extend	27h	Disable
UPC/EAN Security Level	4Dh	0
Linear UPC/EAN Decode	44h	Enable
UPC Half Block Stitching	4Ah	Disable
UPC Composite Mode	F0h 58h	Never Linked



Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Code 128		
Code 128	08h	Enable
UCC/EAN-128	0Eh	Enable
ISBT 128	54h	Enable
Code 128 Decode Performance	48h	Enable
Code 128 Decode Performance Level	49h	Level 1
Code 39		
Code 39	00h	Enable
Trioptic Code 39	0Dh	Disable
Convert Code 39 to Code 32	56h	Disable
Code 32 Prefix	E7h	Disable
Set Length(s) for Code 39	12h 13h	Length within Range: 0-55
Code 39 Check Digit Verification	30h	Disable
Transmit Code 39 Check Digit	2Bh	Disable
Code 39 Full ASCII Conversion	11h	Disable
Code 39 Decode Performance	46h	Enable
Code 39 Decode Performance Level	47h	Level 1
Code 93		
Code 93	09h	Disable

Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Set Length(s) for Code 93	1Ah 1Bh	Length within Range: 0-55
Interleaved 2 of 5		
Interleaved 2 of 5	06h	Disable
Set Length(s) for I 2 of 5	16h 17h	1 Discrete Length: 14
I 2 of 5 Check Digit Verification	31h	Disable
Transmit I 2 of 5 Check Digit	2Ch	Disable
Convert I 2 of 5 to EAN 13	52h	Disable
Discrete 2 of 5		
Discrete 2 of 5	05h	Disable
Set Length(s) for D 2 of 5	14h 15h	1 Discrete Length: 14
Codabar		
Codabar	07h	Enable
Set Lengths for Codabar	18h 19h	Length within Range: 06-55
CLSI Editing	36h	Disable
NOTIS Editing	37h	Disable
MSI Plessey		
MSI Plessey	0Bh	Enable



Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Set Length(s) for MSI Plessey	1Eh 1Fh	Length Within Range: 04 - 55
MSI Plessey Check Digits	32h	One
Transmit MSI Plessey Check Digit	2Eh	Disable
MSI Plessey Check Digit Algorithm	33h	Mod 11/Mod 10
PDF417/MicroPDF417		
PDF417	0fh	Enable
MicroPDF417	E3h	Enable
Code 128 Emulation	7Bh	Disable
RSS		
RSS-14	F0h 52h	Disable
RSS Limited	F0h 53h	Disable
RSS Expanded	F0h 54h	Disable
Composite		
CC-C	F0h 55h	Disable
CC-AB	F0h 56h	Disable
TLC-39	F0h 73h	Disable

Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Data Options		
Transmit Code ID Character	2Dh	None
Prefix/Suffix Values		
Prefix	69h	NULL
Suffix 1	68h	CR
Suffix 2	6Ah	LF
Scan Data Transmission Format	EBh	Data as is
Simple Serial Interface (SSI) Options		
Baud Rate	9Ch	38400
Parity	9Eh	None
Check Parity	97h	Enable
Software Handshaking	9Fh	ACK/NAK
Decode Data Packet Format	EEh	Packeted
Stop Bit Select	9Dh	1
Intercharacter Delay	6Eh	0
Host Serial Response Time-out	9Bh	2 sec
Host Character Time-out	EFh	200 msec
Event Reporting		
Decode Event	F0h 00h	Enable
Boot Up Event	F0h 02h	Enable
Parameter Event	F0h 03h	Enable



Table H-1. Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Macro PDF		
Transmit Each Symbol in Codeword Format	Afh	Disable
Transmit Unknown Codewords	BAh	Disable
Escape Character	E9h	None
ECI		
Delete Character Set ECIs	E6h	Enable
ECI Decoder	E8h	Enable
Transmit Macro PDF User-Selected Field		
Transmit File Name	B0h	Disable
Transmit Block Count	B1h	Disable
Transmit Time Stamp	B2h	Disable
Transmit Sender	B3h	Disable
Transmit Addressee	B4h	Disable
Transmit Checksum	B6h	Disable
Transmit File Size	B5h	Disable
Transmit Macro PDF Control Header	B7h	Disable
Last Block Marker	B9h	Disable



Glossary

ACK/NAK	ACK/NAK is the default software handshaking.
AirBeam Manager	AirBeam Manager is a comprehensive wireless network management system that provides essential functions that are required to configure, monitor, upgrade and troubleshoot the Spectrum24 [®] wireless network and its components (including networked terminals). Some features include event notification, access point configuration, diagnostics, statistical reports, auto-discovery, wireless proxy agents and monitoring of access points and mobile devices.
Aperture	The opening in an optical system defined by a lens or baffle that establishes the field of view.
ANSI Terminal	A display terminal that follows commands in the ANSI standard terminal language. For example, it uses escape sequences to control the cursor, clear the screen and set colors. Communications programs support the ANSI terminal mode and often default to this terminal emulation for dial-up connections to online services.
ASCII	American Standard Code for Information Interchange. A 7 bit-plus-parity code representing 128 letters, numerals, punctuation marks and control characters. It is a standard data transmission code in the U.S.
Autodiscrimination	The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content is decoded.
Bar	The dark element in a printed bar code symbol.
Bar Code Density	The number of characters represented per unit of measurement (e.g., characters per inch).
Bar Height	The dimension of a bar measured perpendicular to the bar width.



Bar Width	Thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.
Baud Rate	A measure of the data flow or number of signaling events occurring per second. When one bit is the standard "event," this is a measure of bits per second (bps). For example, a baud rate of 50 means transmission of 50 bits of data per second.
Bit	Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.
Byte	On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.
BOOTP	A protocol for remote booting of diskless devices. Assigns an IP address to a machine and may specify a boot file. The client sends a bootp request as a broadcast to the bootp server port (67) and the bootp server responds using the bootp client port (68). The bootp server must have a table of all devices, associated MAC addresses and IP addresses.
CDRH	Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.
CDRH Class 1	This is the lowest power CDRH laser classification. This class is considered intrinsically safe, even if all laser output were directed into the eye's pupil. There are no special operating procedures for this class.
CDRH Class 2	No additional software mechanisms are needed to conform to this limit. Laser operation in this class poses no danger for unintentional direct human exposure.
Character	A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.
Character Set	Those characters available for encoding in a particular bar code symbology.

Check Digit	A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.
Codabar	A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- \$: / , +).
Code 128	A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.
Code 3 of 9 (Code 39)	A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9 and 7 special characters (- . / + % \$ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.
Code 93	An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.
Code Length	Number of data characters in a bar code between the start and stop characters, not including those characters.
Continuous Code	A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.
Dead Zone	An area within a scanner's field of view, in which specular reflection may prevent a successful decode.
Decode	To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.
Decode Algorithm	A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.
Decryption	Decryption is the decoding and unscrambling of received encrypted data. Also see, Encryption and Key.
Depth of Field	The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.



DHCP	(Dynamic Host Configuration Protocol) Software that automatically assigns IP addresses to client stations logging onto a TCP/IP network. Similar to BOOTP, but also permits the leasing of an IP address. It eliminates having to manually assign permanent IP addresses. DHCP software typically runs in servers and is also found in network devices such as routers that allow multiple users access to the Internet.
DHCP Server	A server in the network or a service within a server that assigns IP addresses.
Discrete Code	A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.
Discrete 2 of 5	A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.
EAN	European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.
Element	Generic term for a bar or space.
Encoded Area	Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.
ENQ (RS-232)	ENQ software handshaking is also supported for the data sent to the host.
Encryption	Encryption is the scrambling and coding of data, typically using mathematical formulas called algorithms, before information is transmitted over any communications link or network. A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, Decryption and Key.
ESD	Electro-Static Discharge
ESS_ID	Extended Service Set Identifier, defines the coverage area. Prior to the release of the 802.11 specification the ESS_ID was called the Net_ID or Network Identifier. ESS_ID: 32 Alphanumeric characters, (case sensitive).
Flash Memory	Flash memory is responsible for storing the system firmware and is non-volatile. If the system power is interrupted the data will not be lost.

Host Computer	A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs and network control.
IEC	International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.
IEC (825) Class 1	This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.
IEEE Address	See MAC Address .
Intercharacter Gap	The space between two adjacent bar code characters in a discrete code.
Interleaved Bar Code	A bar code in which characters are paired together, using bars to represent the first character and the intervening spaces to represent the second.
Interleaved 2 of 5	A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/STOP characters may be encoded.
IP	(Internet Protocol) The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts "packets" from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a "datagram" to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.
IP Address	(Internet Protocol address) The address of a computer attached to an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a IP network. Client workstations have either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.



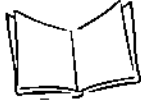
Kerberos	Kerberos is a network authentication protocol. It is designed to provide strong authentication for client/server applications by using secret-key cryptography. A free implementation of this protocol is available from the Massachusetts Institute of Technology. Kerberos is available in many commercial products as well.
Key	A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, Encryption and Decrypting.
LASER - Light Amplification by Stimulated Emission of Radiation	The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.
Laser Diode	A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.
LED Indicator	A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.
MAC Address (also called IEEE Address)	Spectrum24 [®] devices, like other Ethernet devices, have unique, hardware-encoded MAC (also called IEEE addresses). MAC addresses determine the device sending or receiving data. The MAC address is a 48-bit number written as six hexadecimal bytes separated by colons.
MIL	1 mil = 1 thousandth of an inch.
Misread (Misdecode)	A condition which occurs when the data output of a reader or interface controller does not agree with the data encoded within a bar code symbol.
MU	The MU (Mobile Unit) searches for APs with the same ESS_ID and associates with an AP to establish communications.
Null Modem Cable	An RS-232 cable used to connect two personal computers together in close proximity for file transfer. It attaches to the serial ports of both machines and simulates what would occur naturally if modems and the phone system were used. It crosses the sending wire with the receiving wire.
Nominal	The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

Nominal Size	Standard size for a bar code symbol. Most UPC/EAN codes are used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).
Open System Authentication	Open System authentication is a null authentication algorithm.
Parameter	A variable that can have different values assigned to it.
Percent Decode	The average probability that a single scan of a bar code would result in a successful decode. In a well-designed bar code scanning system, that probability should approach near 100%.
PING	(Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.
Print Contrast Signal (PCS)	Measurement of the contrast (brightness difference) between the bars and spaces of a symbol. A minimum PCS value is needed for a bar code symbol to be scannable. $PCS = (RL - RD) / RL$, where RL is the reflectance factor of the background and RD the reflectance factor of the dark bars.
Programming Mode	The state in which a scanner is configured for parameter values. See SCANNING MODE.
Protected Mode	An application can be assigned password protection so that it can only run when a password is entered. The password can be assigned for a specific application via the Configuration Utility, System Menu or the Control Panel.
Quiet Zone	A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.
Reflectance	Amount of light returned from an illuminated surface.
Resolution	The narrowest element dimension which is distinguished by a particular reading device or printed with a particular device or method.
Scan Area	Area intended to contain a symbol.
Scanner	An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are: <ol style="list-style-type: none"> 1. Light source (laser or photoelectric cell) - illuminates a bar code. 2. Photodetector - registers the difference in reflected light (more light reflected from spaces). 3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

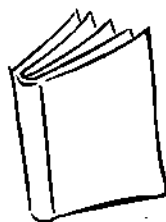


Scanning Mode	The scanner is energized, programmed and ready to read a bar code.
Scanning Sequence	A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.
SDK	Software Development Kit
Self-Checking Code	A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.
Shared Key	Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.
Space	The lighter element of a bar code formed by the background between bars.
Specular Reflection	The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.
Start/Stop Character	A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.
Subnet Mask	A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.
Substrate	A foundation material on which a substance or image is placed.
Symbol	A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters and check characters.
Symbol Aspect Ratio	The ratio of symbol height to symbol width.
Symbol Height	The distance between the outside edges of the quiet zones of the first row and the last row.
Symbol Length	Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character.
Symbology	The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).

TCP/IP	<p>(Transmission Control Protocol/Internet Protocol) A communications protocol used to interconnect dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications.</p> <p>TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted.</p> <p>IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.</p>
Telnet	<p>A terminal emulation protocol commonly used on the Internet and TCP/IP-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program.</p>
TFTP	<p>(Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading firmware, downloading software and remote booting of diskless devices.</p>
Tolerance	<p>Allowable deviation from the nominal bar or space width.</p>
UDP	<p>(User Datagram Protocol) A protocol within the IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.</p>
UPC	<p>Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which is any of four widths. The standard symbology for retail food packages in the United States.</p>
Visible Laser Diode (VLD)	<p>A solid state device which produces visible laser light.</p>



- WEP Encryption** (Wired Equivalent Privacy encryption) The conversion of data into a secret code for transmission over a public network. The original text, or plaintext, is converted into a coded equivalent called ciphertext via an encryption algorithm. The ciphertext is decoded (decrypted) at the receiving end and turned back into plaintext.
The encryption algorithm uses a key, which is a binary number that is typically from 40 to 128 bits in length. The greater the number of bits in the key (cipher strength), the more possible key combinations and the longer it would take to break the code. The data is encrypted, or "locked," by combining the bits in the key mathematically with the data bits. At the receiving end, the key is used to "unlock" the code and restore the original data.
- WEP** Wired Equivalent Privacy, is specified by IEEE for encryption and decryption of RF (wireless) communications.
- WNMP** (Wireless Network Management Protocol) This is Symbol's proprietary MAC layer protocol used for inter access point communication and other MAC layer communication.
- WNMS (has been renamed to AirBeam Manager)** See AirBeam Manager



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